
SMITHSONIAN INSTITUTION
THE LIBRARY


SMITHSONIAN INSTITUTION THE LIBRARY

SOURCES OF HYDROGRAPHIC AND METERIOLOGICAL DATA ON THE GREAT LAKES

SPECIAL SCIENTIFIC REPORT–FISHERIES No. 314

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Explanatory Note

The series embodies results of investigations, usually of restricted scope, intended to aid or direct management or utilization practices and as guides for administrative or legislative action. It is issued in limited quantities for the official use of Federal, State, or cooperating Agencies and in processed form for economy and to avoid delay in publication.

United States Department of the Interior, Fred A. Seaton, Secretary
Fish and Wildlife Service, Arnie J. Suoemla, Commissioner

SOURCES OF HYDROGRAPHIC AND METERIOLOGICAL DATA ON THE GREAT LAKES

by

Charles F. Powers and David L. Jones
Research Associates
and
John C. Ayers, Project Director
Great Lakes Research Institute
University of Michigan
Ann Arbor, Michigan

U. S. Fish and Wildlife Service
Contract No. 14-19-008-9381

United States Fish and Wildlife Service
Special Scientific Report--Fisheries No. 314

Washington, D. C.
July 1959

Library of Congress catalog card for the Fish and Wildlife Service Series, Special Scientific Report--Fisheries:

U. S. *Fish and Wildlife Service.*
Special scientific report: fisheries. no. 1–
[Washington] 1949–
no. illus., maps, diagrs. 27 cm.
Supersedes in part the Service's Special scientific report.

1. Fisheries—Research.

SH11.A335 639.2072 59–60217

Library of Congress [2]

TABLE OF CONTENTS

	Page
1. Introduction	1
2. Procedure	3
3. Compilation of information	10
4. Sources of data	
Table 1. Onshore data sources	11
Lake Superior	18
St. Marys River	32
Lake Michigan	38
Lake Huron	64
St. Clair River - Lake St. Clair - Detroit River	76
Lake Erie	82
Niagara River	96
Lake Ontario	100
Table 2. Inland data sources	110
Minnesota	113
Wisconsin	113
Illinois	115
Indiana	115
Michigan	117
Ohio	120
Pennsylvania	122
New York	122
Ontario	125
Table 3. Unusable data sources	130
5. Summary	132
Table 4. Summary of knowledge of all potential data sources	133
Table 5. Summary of knowledge of usable data sources	135
Appendix I - Bibliography	139
Appendix II - Index and period of record for meteorological stations in Ontario	160

List of Figures

1. Questionnaire on meteorological and hydrographic records	5
2. Orientation chart, Lake Superior and St. Marys River	17
3. Orientation chart, Lake Michigan	37
4. Orientation chart, Lake Huron	63
5. Orientation chart, Lake Erie (including St. Clair River, Lake St. Clair, Detroit River, and Niagara River)	75
6. Orientation chart, Lake Ontario	99
7. Orientation chart, Great Lakes drainage basin	112
8. Percent frequency of all potential data sources	137
9. Summary of knowledge of all potential data sources	138

1. INTRODUCTION

The Great Lakes are undoubtedly the most important single source of fresh water in the world. Their waters are utilized for numerous economic needs, such as commercial and sport fishing, power generation, municipal water supplies, industrial uses, recreation, and navigation. In line with this high degree of economic importance, the Great Lakes are now and will most likely continue to be the subjects of various scientific studies and investigations, carried out with a view toward obtaining a more lucid understanding of their physical, chemical, and biological properties and mechanisms. In conjunction with studies such as these, personnel of the Great Lakes Fisheries Investigations suggested that a great deal of limnological and meteorological information relative to the Lakes and their drainage basins would likely be available from agencies in both the United States and Canada. Likely sources would be those which routinely make use of raw lake water, such as municipal water treatment plants, disposal plants, power plants, and industries. In addition, it was believed that data might also be obtained from various governmental agencies--federal, state, and provincial. Parameters which might possibly be located were thought to include water temperature, turbidity, pH, color, and odor; chemical analyses of water; biological analyses, such as bacterial and plankton counts; water level; lake surface condition; and numerous meteorological observations, such as air temperature, precipitation, wind speed and direction, humidity, radiation, evaporation, pressure, visibility, and cloud cover.

Up to the present time little was known specifically about the availability, reliability, and extent of any data such as those enumerated above. In addition, data would likely be widely scattered and hence of little practical use to anyone interested in utilizing the contained information. It became apparent, therefore, that the location and evaluation of these collateral data should become the object of a special study.

It was proposed that the execution of such a study could best be accomplished in three phases, with the exact nature and extent of each succeeding phase governed by findings of the preceding one. Phase I would be designed to locate and determine the extent of records in the Great Lakes area that might be useful in developing a better understanding of Great Lakes hydrography. Phase II would involve a pilot study in a selected section of the Great Lakes in which all available data would be examined to determine the reliability and usefulness of the various types of records. In Phase III all records demonstrated by Phase II to be of value in hydrographic and biological studies of the Great Lakes would be accumulated over a period determined by the completeness and congruity of data, and recorded in a form suitable for easy reference and use in future studies.

Phase I was undertaken by the Great Lakes Research Institute during the past fiscal year, and is the subject of the present report.

Many persons, institutions, and agencies have been of immeasurable aid in the successful conduct of this investigation. The investigators wish to gratefully acknowledge the invaluable assistance and wholehearted cooperation of the following persons who, in various ways, were instrumental in helping locate sources of meteorological and hydrographic data: Dr. James W. Moffett, Chief, Great Lakes Fishery Investigations, U. S. Fish and Wildlife Service, Ann Arbor, Michigan; Dr. Stanford H. Smith,

Fishery Research Biologist, U. S. Fish and Wildlife Service, Ann Arbor, Michigan; Dr. Ralph Hile, Fishery Research Biologist, U. S. Fish and Wildlife Service, Ann Arbor, Michigan; Dr. Alfred M. Beeton, U. S. Fish and Wildlife Service, Ann Arbor, Michigan; James H. Johnson, Fishery Research Biologist, U. S. Fish and Wildlife Service, Ann Arbor, Michigan; Dr. D. V. Anderson, Ontario Department of Lands and Forests, Maple, Ontario; Dr. Albert Ballert, Great Lakes Commission, Ann Arbor, Michigan; N. H. Beamer, U. S. Geological Survey, Philadelphia, Pennsylvania; Dr. Albert E. Berry, General Manager, Ontario Water Resources Commission, Toronto, Ontario; Prof. Herbert M. Bosch, School of Public Health, University of Minnesota, Minneapolis, Minnesota; C. C. Boughner, Chief, Climatological Section, Department of Transport, Toronto, Ontario; A. V. DeLaporte, Director of Laboratories and Research, Ontario Water Resources Commission, Toronto, Ontario; Earl Devendorf, Director, Bureau of Environmental Sanitation, New York State Department of Health, Albany, New York; A. H. Eichmeier, State Climatologist, U. S. Weather Bureau, East Lansing, Michigan; N. G. Gray, Dominion Hydrographer, Department of Mines and Technical Surveys, Ottawa, Canada; J. R. Harvey, Regional Sanitary Engineer, Department of Health, Commonwealth of Pennsylvania, Meadville, Pennsylvania; J. H. Hubble, U. S. Geological Survey, Columbus, Ohio; Russell L. Johnson, Engineer in Charge, Michigan Department of Health, Escanaba, Michigan; Ray Joiner, Assistant to the Director, National Weather Records Center, U. S. Weather Bureau, Asheville, North Carolina; Lothar A. Joos, State Climatologist, U. S. Weather Bureau, Champaign, Illinois; Homer Knox, Principal Assistant Sanitary Engineer, State Department of Health, Columbus, Ohio; Robert Knutilla, U. S. Geological Survey, Escanaba, Michigan; W. T. Laidley, Chief Technical Assistant, U. S. Lake Survey Office, Detroit, Michigan; C. R. MacLean, Captain, U. S. Coast Guard, Chief, Operations Division, Ninth Coast Guard District, Cleveland, Ohio; Colin MacMillan, Marathon Paper Mills, Marathon, Ontario; Dr. O. J. Muegge, State Sanitary Engineer, State of Wisconsin Board of Health, Madison, Wisconsin; L. T. Pierce, State Climatologist, U. S. Weather Bureau, Columbus, Ohio; Dr. B. A. Poole, Director, Bureau of Environmental Sanitation, Indiana State Board of Health, Indianapolis, Indiana; H. W. Poston, Assistant Regional Engineer, U. S. Public Health Service, Chicago, Illinois; Jack Rademacher, Sanitary Engineer, U. S. Public Health Service, Chicago, Illinois; Lawrence A. Schaal, State Climatologist, U. S. Weather Bureau, Lafayette, Indiana; Cdr. E. O. Standish, Office of Chief of Naval Operations, U. S. Navy, Washington, D. C.; The State Climatologist, U. S. Weather Bureau, Albany, New York; Joseph H. Strub, Jr., State Climatologist, U. S. Weather Bureau, Minneapolis, Minnesota; J. F. J. Thomas, Head, Industrial Waters Section, Department of Mines and Technical Surveys, Ottawa, Ontario; Kenneth G. Tower, Regional Engineer, Federal Power Commission, Chicago, Illinois; T. L. Vander Velde, Chief, Section of Water Supply, Division of Engineering, Michigan Department of Health, Lansing, Michigan; Paul J. Waite, State Climatologist, U. S. Weather Bureau, Madison, Wisconsin; Fredrick H. Waring, Chief Engineer, State Department of Health, Columbus, Ohio; George Whetstone, U. S. Geological Survey, Columbus, Ohio; G. H. Wood, District Engineer, Department of Northern Affairs and National Resources, Water Resources Branch, Ottawa, Ontario; Frank L. Woodward, Director, Division of Environmental Sanitation, Minnesota Department of Health, Minneapolis, Minnesota.

The investigators are no less indebted to the various persons who were contacted at the individual agencies during the course of the study. The limitations of space do not permit listing them here, but the majority have been identified in the tabulation of sources in Table 1. To all these persons who provided essential information, and thereby contributed to the successful completion of this survey, we extend our sincere thanks.

2. PROCEDURE

In order to expedite the search for data sources, the study was divided into two basic parts: the hydrographic and the meteorological. This was a natural division since the bulk of the meteorological data was expected to originate at points apart from the sources of hydrographic data. However, it was known that certain agencies obtaining routine hydrographic data also obtained concomitant meteorological observations. In such cases, it became the responsibility of the personnel in the hydrographic division of the study to ascertain the necessary information relative to the meteorological observations, and to then transmit it to personnel in the meteorological division. The primary reason that many meteorological sources are different from hydrographic sources is because it was deemed necessary to obtain meteorological data not only around the periphery of the Lakes, but inland for some distance as well. The influence of the Lakes on weather conditions, and the influence of weather on the Lakes, is known to encompass an area around the Lakes as well as over the Lakes themselves. The exact limits of this "area of influence" are yet not completely determined, but for the purposes of this study have been confined to the drainage area of the Great Lakes (Fig. 7).

The first effort by project personnel to locate all pertinent sources of meteorological data within the Great Lakes basin was made by contacting the National Weather Records Center of the U. S. Weather Bureau at Asheville, North Carolina, and the Meteorological Division of the Canadian Department of Transport in Toronto, Ontario. These two agencies provided project personnel with information on meteorological data that is published. This comprised the largest source of all types of data uncovered by the project: 808 sources or 68.6 per cent of the total of 1177 sources (see Table 4, p. 133).

All other meteorological data sources ascertained by the project are comprised of unpublished, unprocessed data on file at each station or a central repository. The data are recorded by U. S. Coast Guard Stations (some of the data from a few of these are published in U. S. Weather Bureau climatological summaries), water treatment plants, industries and power plants, sewage treatment plants, paper mills, commercial and research lake vessels, and a few other sources such as university research groups, individual observers, and governmental and public service organizations.

The search for hydrographic sources was initiated by concentrating first upon the water treatment plants. Information concerning data available from such plants in the United States was obtained by contacting the head offices of the public health departments of the states bordering the Great Lakes: Illinois, Indiana, Michigan, Minnesota, Ohio, Pennsylvania, New York, and Wisconsin. In Michigan and Ohio, at least a portion of the data from these plants was found to be available from the head offices, where it is kept on file. In the other states, data are retained in the files of the individual plants, from which they may be obtained. Information on water treatment plants in Ontario was furnished by the Ontario Water Resources Commission.

Another source investigated early in the study comprised the power plants which utilize water from the Lakes. A list of all such plants on

the United States side of the Lakes was obtained from the Federal Power Commission at Chicago; this list included public utilities, industries, and municipal plants. For information on the Canadian side, the Hydro-Electric Power Commission of Ontario was contacted.

The pertinent water treatment plants and power plants were then contacted individually. In some cases personal visits were possible, but usually contact was by mail. Each potential data source not visited by project personnel was sent a letter outlining the project, its aims and purpose, and the type of cooperation sought. Included with the letter was a three-page questionnaire designed to facilitate the agency's reply. The questionnaire, which is reproduced in Figure 1, is a form on which each observation could be entered, whether hydrographic or meteorological. Space for pertinent information concerning the observation was also provided. It will be noted that a good deal of the information requested on the questionnaire, i.e., time of observation, type of instrument or process, instrument sensing element, and name of observer, are items which were not required under the terms of the study, but were considered pertinent and hence ascertained whenever possible. Information relating to these items was not determined for all cooperating agencies, and is not included in this report. That which is known is on file with the Great Lakes Research Institute.

It should be pointed out here that rigid adherence to a strict policy in contacting and obtaining information from the various agencies was not possible; that is, in some cases the use of questionnaires was impractical, in others they served to collect information that otherwise would likely have been overlooked.

The water treatment plants and power plants constituted the bulk of the hydrographic data sources from which any great variety of data were available. However, a number of additional agencies contacted also were able to make significant contributions. Specific reference to these agencies is made in section 3 of this report.

During the course of the investigation, items of pertinent literature appeared from time to time, and have been included in the Bibliography (Appendix I). Also included in the Bibliography are selected references from a bibliography of the Great Lakes (Van Oosten, John. Great Lakes Fauna, Flora, and their Environment. A Bibliography. Great Lakes Commission, Ann Arbor, Mich., 1957). Selection of these references was based upon applicability to the interest area of the project.

Contained within Van Oosten's bibliography are 138 papers from Lake Erie on subjects within the interest area of this project, 57 from Lake Michigan, 22 from Lake Superior, 19 from Lake Ontario, 13 from Lake Huron, and 42 pertinent to all the Great Lakes. Of these, there are certain papers which cover comparable subjects at different times and which have promise of providing direct material upon possible changes in the Great Lakes.

Figure 1

UNIVERSITY OF MICHIGAN
GREAT LAKES RESEARCH INSTITUTE
U. S. Dept. of Interior - Great Lakes Collateral Data

QUESTIONNAIRE ON METEOROLOGICAL AND HYDROGRAPHIC RECORDS

Organization_____ Address_____ Date_____

Parameter Measured	Time of Observation	Period of Record	Type of Instrument or Process	Instrument Sensing Element		Disposition of Data	Name of Observer	Remarks
				Exposure	Location			
Air temperature								
extremes								
Water temperature								
extremes								
ice formation								
ice dissipation								

Figure 1 (cont.)

Parameter Measured	Time of Observation	Period of Record	Type of Instrument or Process	Instrument Sensing Element		Disposition of Data	Name of Observer	Remarks
				Exposure	Location			
Precipitation								
liquid								
solid								
solid cover								
extremes								
Wind speed								
instantaneous								
total movement								
extremes								
Wind direction								
Humidity								
dew point								
Solar radiation								
Evaporation								

Figure 1 (cont.)

Parameter Measured	Time of Observation	Period of Record	Type of Instrument or Process	Instrument Sensing Element		Disposition of Data	Name of Observer	Remarks
				Exposure	Location			
Pressure								
Visibility								
Cloud cover								
types								
heights								
Other (specify)								
Chemical Analyses								
Total alkalinity								
Total hardness								
pH								
Other (specify)								

Parameter Measured	Time of Observation	Period of Record	Type of Instrument or Process	Instrument Sensing Element		Disposition of Data	Name of Observer	Remarks
				Exposure	Location			
Physical Analyses								
Turbidity								
Color								
Odor								
Other (specify)								
Biological Analyses								
Standard plate count								
Coliform								
Plankton								
Water level								
Water currents								
Wave heights								
Other (specify)								

The bibliography appended to the report does not represent, and is not intended to represent, an exhaustive compilation of all literature pertinent to hydrographic and meteorological aspects of the Great Lakes. It is included for the convenience of the reader, as a compilation of pertinent literature that has come to the attention of the investigators during the course of this study.

3. COMPILATION OF INFORMATION

Most of the information relating to sources of data is of such nature that it can be readily tabulated. In Table 1 are listed sources of hydrographic and/or meteorological data that are located on the periphery of the Lakes. All meteorological stations located no farther than two miles from the lake shore are included in this table. Entries have been listed geographically, proceeding counterclockwise around each Lake, as noted in the table.

In Table 2 are listed all those sources of meteorological data occurring within the Great Lakes drainage basin but located more than two miles from the nearest Great Lake. Geographical listing by state or province is shown. It is not feasible in Table 2 to list each station geographically, hence items have been entered alphabetically by state or province. Individual stations may be located by use of the included coordinates.

To facilitate geographical orientation, a series of six orientation plates have been included, five within Table 1 and one preceding Table 2. Figures 2 through 6 depict the five Lakes: Superior, Michigan, Huron, Erie, and Ontario. The St. Marys River appears in Figure 2, and the St. Clair River, Lake St. Clair, Detroit River, and Niagara River in Figure 6. Figure 7 shows the entire area of the Great Lakes drainage basin. All meteorological sources within this basin that have been ascertained by the present research are listed, partly in Table 1 and in all of Table 2; all hydrographic data sources on the periphery of the Lakes are listed as part of Table 1. In addition, station circles are shown in Figure 7 outside the drainage basin periphery. These are meteorological stations that are in close proximity to the basin periphery. They are listed as part of the present research since there are frequent occurrences where suitable data sources close to the periphery, but within the basin, are not available.

Table 3 contains all those sources which, for specified reasons, had no usable data, or so few that they were considered unsuited to the purposes of this study.

Table 1. Onshore Data Resources

A. Pagination

The large volume of information pertinent to each data source has necessitated the use of two pages for each source. These appear on facing pages which are numbered consecutively. The information is presented in eight groups (five Lakes, three connecting waterways) beginning with Lake Superior and proceeding eastward. Data sources are listed geographically within each group beginning at an arbitrary point and proceeding counterclockwise around each Lake or through each of the waterways.

Each data source location is numbered serially within its group, the number appearing in the first column of each facing page. Numbers identify the location on the second page where designation by name has been omitted.

B. Agency and Contact

In column 3, Agency refers to the particular organization which obtains data at the specific location designated in column 2; Contact refers to the person within the organization who should be consulted in regard to any data recorded.

In the tabulations a contact is not given for stations whose records are available from some central compilation office. Agencies included in this category are as follows:

1. U. S. Weather Bureau First Order, Second Order and Cooperative stations, U. S. Naval Air Stations, and U. S. Air Force Bases. Data from these agencies are filed with and obtainable from the National Weather Records Center, Asheville, North Carolina.

2. Canadian Meteorological Division Class I, II, III, and c stations. Data from these agencies are filed with and obtainable from the Climatological Section, Meteorological Division, Department of Transport, Toronto, Ontario.

3. U. S. Lake Survey water level records. Data are obtainable from the U. S. Lake Survey Office, 630 Federal Building, Detroit 26, Michigan.

4. Canada Hydrographic Service water level records. Data are obtainable from the Dominion Hydrographer, Canadian Hydrographic Service, Canada Department of Mines and Technical Surveys, Ottawa, Ontario.

5. U. S. Coast Guard installations. With respect to collection of

meteorological and lake state data, Coast Guard installations are divided into two categories: those making regular reports every six hours to the U. S. Weather Bureau, and those which take four-hourly observations; most of the latter are retained by the Coast Guard.

Data from the former category are obtainable from the National Weather Records Center at Asheville, and from the latter are obtainable from U. S. Coast Guard Headquarters, Washington, D. C. Coast Guard station personnel retain copies of the meteorological logs for a period of twelve months; hence, data for any immediately preceding year may be obtained directly from the station in question. In Table 1, the six-hourly and four-hourly stations are so designated.

6. Naval Air Stations; U. S. Air Force Bases. Data are filed with and obtainable from the National Weather Records Center at Asheville.

7. Michigan municipal water treatment plants. All plant records are filed with the Michigan Department of Health. Information on Upper Peninsula plants may be obtained from the Michigan Department of Health, 19th Street and 13th Avenue North, Escanaba, Michigan. Information on Lower Peninsula plants is obtainable from the Michigan Department of Health, Division of Engineering, Lansing 4, Michigan.

In Column 3 of Table 1, contacts for Michigan water treatment plants are indicated by either Escanaba or Lansing, to specify the data location.

C. Modification of Contact Procedure

In regard to municipal water treatment plants located in Ohio, a modified contact procedure is recommended. Chemical data obtained at the plants are filed with the Ohio State Department of Health at Columbus, but some physical data may be retained at plants and may be obtained directly from the individual plant operators. Initial inquiries should be addressed to the Chief Engineer, State Department of Health, 301 Ohio Departments Building, Columbus, Ohio.

In Column 3 of Table 1, contacts for Ohio water treatment plants will indicate the name of the superintendent of the plant, followed by Columbus.

D. Period of Record

The number of years over which records are available has been ascertained for a large number of the located data sources. Under the period of record for a particular agency, a specific date followed by a dash indicates that data are available from that year to the present. Records pertaining to U. S. Weather Bureau First and Second Order and Cooperative stations indicate the amount of data available in terms of total years. These are not necessarily consecutive years; hence, ascertainment of any missing record is accomplished only by examination of the complete history of the station in question. Accordingly, periods of record for U. S. Weather Bureau stations are entered in Table 1 as total years of data, and specific dates are not given.

An index and period of record listing for CMD stations in Ontario were made available to the project subsequent to the publication date. The index has been appended to this report as Appendix II; however, since the data had already been summarized for this report, Tables 1-5 and Figures 2-9 have not been changed to fit the new information in Appendix II. Footnotes have been added at applicable points to Tables 1 and 2 to call attention to this fact.

Information of the lengths of records of U. S. Coast Guard installations is not readily available, but may be obtained for four-hourly stations from the Coast Guard Headquarters at Washington, D. C., and for six-hourly stations from the National Weather Records Center at Asheville.

Water level records obtained from gaugings of the U. S. Lake Survey and Canadian Hydrographic Service are available back to 1860 for each Lake and for connecting waterways. The single exception is the St. Clair River, for which records are available back to 1898.

The water level records are regularly published as monthly means, in both tabular and hydrograph form, for each Lake taken as a unit. Records for individual gauges are available only upon specific request. Periods of record vary among individual gauges, and hence the date 1860 does not necessarily refer to any particular gauge, but rather to average values for each Lake.

United States water level data are available from the U. S. Lake Survey, U. S. Army Corps of Engineers, 630 Federal Building, Detroit 26, Michigan.

Canadian water level data are available from the Dominion Hydrographer, Canadian Hydrographic Service, Canada Department of Mines and Technical Surveys, Ottawa, Ontario.

The periods of record for some sources may vary internally, that is, different observations have been carried out for varying lengths of time. In such cases the notation "variable--see data" has been entered in the Period of Record column, and the appropriate dates have been entered in the individual parameter columns. In some of these cases, the period of record is known for some data, but not for others. In this event, observations known to be taken, but for which the period of record is unknown, are indicated by "(X)".

The symbol "X" (not enclosed by parentheses) is used in two instances, 1) whenever it is known that the period of record is homogeneous for the observations taken; that is, whenever there is a single known period of record which embraces all the observations made at the particular station, and 2) whenever it is known that observations are made at the station, but the period of record is not known for any of them.

Unmarked spaces in Table 1 indicate that, so far as it is known to the investigators, no observations are made of that parameter.

E. Data

Many meteorological data are obtained by U. S. Weather Bureau First and Second Order stations, Canadian Meteorological Division Class I stations, U. S. Coast Guard installations, U. S. Naval Air Stations, and U. S. Air Force Bases. The distinctions between U. S. Coast Guard Stations, as far as their meteorological observations are concerned, are made on page 15. U. S. Naval Air Stations and Air Force Bases are equipped and staffed to record the data called for by WBAN (Weather Bureau-Air Force-Navy) Form 10; hence, for the purposes of this report, they are placed in the same classification as U. S. Weather Bureau First and Second Order stations.

The distinctions between U. S. Weather Bureau First and Second Order stations are as follows: First Order stations are staffed by full-time Civil Service personnel. The stations may or may not operate 24 hours per day, they may or may not be equipped with full instrumentation, hence they may or may not take special or synoptic observations. Those First Order stations that do not operate at all times or take full observations are functionally important in the work of the Bureau; there are only one or two included in this report. Second Order stations are staffed by certificated personnel to take full synoptic weather observations; they may or may not be Civil Service personnel. Examples of Second Order stations are U. S. Coast Guard Stations and Civil Aeronautics Administration communications stations at airports otherwise without Weather Bureau personnel.

A substation of the U. S. Weather Bureau is staffed by a volunteer individual or organization to make at least one observation per day. He is furnished with equipment to record precipitation and/or temperature extremes; he may or may not have equipment for measuring additional weather elements. This type of data source is referred to in this report as a USWB Cooperative.

The Canadian Meteorological Division Class II station also fits this description. Canadian Class III stations are equipped only with a rain gauge; Canadian c stations are equipped only with a sunshine recorder and/or an anemometer. These stations are referred to in this report, respectively, as CMD I, CMD II, CMD III, and CMD c.

To avoid lengthy repetition of citing the data in the tabulations that are recorded by USWB First and Second Order stations, CMD Class I stations, and U. S. Coast Guard, Naval Air, and Air Force stations, the parameters taken by each group are specified below. In Table I, a page and paragraph reference is given in the Other column under Meteorological Data, referring to the following parameters measured at each station:

1. U. S. Weather Bureau First and Second Order stations, U. S. Naval Air Stations, U. S. Air Force Bases, and Canadian Meteorological Division Class I stations:

ceiling height	wind direction
sky condition	wind speed
visibility	air temperature
present weather	cloud types*
obstructions to vision	precipitation
sea level pressure	barometric tendency
dew point	unusual phenomena

* Canadian Class I stations report cloud types in tenths of total sky covered; many record sunshine.

2. U. S. Coast Guard installations

a. Six-hourly reporting stations (data transmitted to U. S. Weather Bureau every six hours):

sky cover	ice, kind
wind direction	ice thickness
wind speed	ice, effect on navigation
visibility	ice, change
present weather	air temperature
obstructions to vision	temperature, wet bulb
past weather	water temperature
waves, direction from	sea level pressure
wave period	unusual phenomena
wave height	

b. Four-hourly reporting stations (data retained at Coast Guard Headquarters, Washington, D. C.):

wind direction	present weather
wind speed	cloud types
sea level pressure	cloud direction
air temperature	cloud speed
humidity	lake state
water temperature	

F. Second Page

The "second pages" of Table 1 are pertinent only to those installations which obtain hydrographic data. However, in order to maintain proper continuity, the serial numbers of all data sources, both meteorological and hydrographic, are entered on this page.

The second column indicates the position in the Lake of the raw water intake. The first number refers to the distance (in feet) that the intake is located from the shore. The second number, enclosed in parentheses, indicates the depth of the intake below the surface of the water in feet. This indicated depth must be taken as only an approximate figure in most cases, due to the difficulty in ascertaining the actual reference level used in computing the depth. It is usually the depth below mean lake level.

G. U. S. Public Health Service Special Study

Certain water treatment plants on Lake Michigan are of particular interest in connection with a special study presently being conducted by the U. S. Public Health Service through its Chicago (Region V) offices. This study was prompted by the difficulty of many Lake Michigan plants to obtain effective water filtration, due primarily to intense seasonal plankton blooms. A portion of this study involves the identification of water quality conditions which contribute to the difficulty of obtaining proper filtration runs. In this connection, efforts are being made to standardize observation techniques utilized in the determination of chemical, physical, and biological characteristics of the raw water taken in by the various plants.

The study is at present designed to extend through, and possibly beyond, 1958. During the period of the study, all participating plants will make the following observations, using a standard methodology prescribed by the U. S. Public Health Service: water temperature, air temperature, weather conditions, wind direction, wind speed, lake surface current direction, turbidity, pH, alkalinity, chlorine demand, and chlorine residual. Many of the cooperating plants obtained these observations prior to the initiation of the special study; a few expanded their operations to include them at least through the present year.

Water treatment plants are involved at the following locations: Green Bay, Wisconsin; Sheboygan, Wisconsin; Milwaukee, Wisconsin; Waukegan, Illinois; Evanston, Illinois; Chicago (South District Filtration Plant), Illinois; Gary-Hobart, Indiana; Michigan City, Indiana; Benton Harbor, Michigan; Holland, Michigan; Grand Rapids, Michigan; and Muskegon, Michigan. These plants are identified in Table 1 in the remarks column by the notation USPH cooperator.

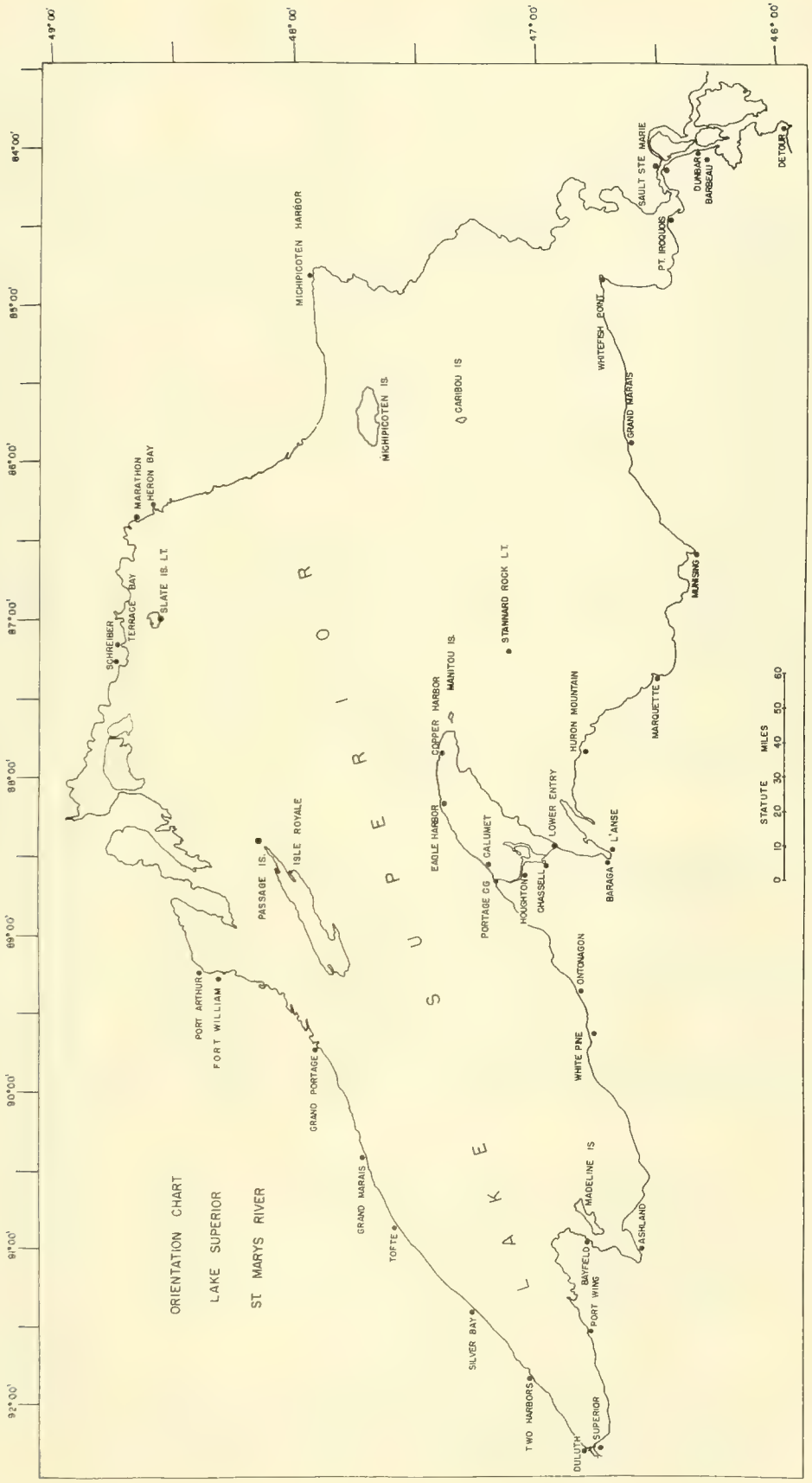

Figure 2. Orientation Chart, Lake Superior and St. Marys River

Table 1. Onshore Data Sources

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
LAKE SUPERIOR (beginning at international boundary and proceeding counterclockwise)								
1	Grand Portage, Minn.	USWB cooperative	--			X	X	
2	Grand Marias, Minn.	USCG Rock of Ages Light (4 hrly)	--	X	X	X		p 15, 2b
3	Grand Marias, Minn.	USCG North Superior Lifeboat (6 hrly)	--	X	X	X		p 15, 2b
4	Grand Marias, Minn.	USWB cooperative	50			X	X	
5	Tofte, Minn.	USWB cooperative	16			X	X	
6	Silver Bay, Minn.	Reserve Mining Co. E. W. Davis	variable see data	1955-	1955-	1955-		pressure, 1955-
7	Silver Bay, Minn.	Water treatment plant A. A Jensen, Supt.	variable see data	1955-	1955-	1955-		
8	Two Harbors, Minn.	Water treatment plant R. W. Gustavson, City Clerk	--					
9	Two Harbors, Minn.	USCG Two Harbors Light (4 hrly)	--	X	X	X		p 15, 2b
10	Two Harbors, Minn.	USCG Split Rock Light (4 hrly)	--	X	X	X		p 15, 2b

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
1											
2											
3											
4											
5											
6	680 (50)	1955-		1955-	1955-	1956-	1955-			plankton (once/ year), 1956- lake level 1954	
7	525 (52)	1954-				1954-				lake level 1955	
8	--	(X)				(X)					
9											
10											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
11	Two Harbors, Minn.	USWB cooperative	65			X	X	
12	Two Harbors, Minn.	U. S. Lake Survey	--					
13	Duluth, Minn.	Water treatment plant A. V. Biele, Chemist	1948-					
14	Duluth, Minn.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
15	Duluth, Minn.	USCG Superior Entry Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
16	Duluth, Minn.	USWB First Order	80	X	X	X	X	p 15, 1
17	Duluth, Minn.	Minnesota Power & Light Co. Hubbell Carpenter, Vice Pres. & Ch. Engr.	--			X		weather
18	Duluth, Minn.	U. S. Lake Survey	--					
19	Superior, Wisc.	Superior Water, Light, and Power Co. W. R. Olsen, Ch. Engr.	1942-					
20	Superior, Wisc.	USWB cooperative	50			X	X	
21	Port Wing, Wisc.	USWB cooperative	12			X	X	
22	Bayfield, Wisc.	USCG Devils Island Light (4 hrly)	--	X	X	X		p 15, 2b

No.	Intake location (ft)	Hydrographic Data								Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
11											
12										lake level (cont.)	
13	1500 (65)	X		X	X	X	X			NH_3, Diss. O_2, Total Fe, BOD, Plankton (see remarks)	Plankton studies during 1939, 40, 41
14											
15											
16											
17											
18										lake level (cont.)	
19	slip at shoreline, 12 ft deep	X									
20											
21											
22											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
23	Bayfield, Wisc.	USCG Outer Island Light (4 hrly)	--	X	X	X		p 15, 2b
24	Bayfield, Wisc.	USCG Mooring (4 hrly)	--	X	X	X		p 15, 2b
25	Bayfield, Wisc.	USCG La Pointe Light (4 hrly)	--	X	X	X		p 15, 2b
26	Bayfield, Wisc.	USWB cooperative	38			X	X	
27	Madeline Is., Wisc.	USWB cooperative	14			X	X	
28	Ashland, Wisc.	USWB cooperative	variable see data			55	58	
29	Ashland, Wisc.	Water treatment plant J. A. Snow, Mgr.	"many years"	(X)				
30	Ashland, Wisc.	Lake Superior District Power Co., K. S. Austin, Ch. Engr.	1949-					
31	Ashland, Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
32	White Pine, Mich.	Water Treatment Plant (White Pine Copper Co.) (Escanaba)	variable see data	1956-		1955-		cloud cover, 1952
33	Ontonagan, Mich.	USWB cooperative	1916-				X	
34	Ontonagan, Mich.	USWB cooperative	38			X	X	

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
23											
24											
25											
26											
27											
28											
29	2000 (22)	(X)						(X)			
30	slip on W. side of plant	(X)									intake water artificially heated in winter
31											
32	-- (30)	1955-		1954-	1954-	1952-	1954-	1952-		color, 1952 fluoride, 1955	
33											
34											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
35	Portage, Mich.	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
36	Houghton-Keweenaw, Mich.	USCG Houghton-Keweenaw Light (4 hrly)	--	X	X	X		p 15, 2b
37	Calumet, Mich.	Calumet & Heckla water treatment plant (Escanaba)	variable see data	1955-	1955-			
38	Calumet, Mich.	Tamarack water treatment plant (Escanaba)	1955-	X	X			
39	Eagle Harbor, Mich.	USCG Light (6 hrly)	--	X	X	X		p 15, 2a
40	Copper Harbor, Mich.	USWB cooperative	16				X	
41	Manitou Island, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
42	Keweenaw (Chassell), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
43	Lower Entry, Mich.	U. S. Lake Survey	--					
44	Baraga, Mich.	USWB cooperative	16				X	
45	Baraga, Mich.	Water treatment plant (Escanaba)	1955-	X	X			
46	L'Anse, Mich.	Water treatment plant (Escanaba)	variable see data	1950-				
47	L'Anse, Mich.	USWB cooperative	20			X	X	

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
35											
36											
37	900 (12)	1955-				1956-		1955-			weekly temps 1950-; weekly coli. 1950-
38	350 (16)	X				X		X			weekly turbidity and coliform 1950-
39											
40											
41											
42											
43										lake level (tri-daily)	
44											
45	--(16)	X						X			hourly temps, but unreliable thermometer
46	1000 (48)	1954-			1956-	1956-		1955-		color, 1956-	
47											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
48	Huron Mountain, Mich.	USWB cooperative	--				X	
49	Stannard Rock, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
50	Marquette, Mich.	USWB First Order	87	X	X	X	X	p 15, 1
51	Marquette, Mich.	USCG Passage Island Light (6 hrly)	--	X	X	X		p 15, 2a
52	Marquette, Mich.	U.S. Lake Survey	--					
53	Marquette, Mich.	Northern Mich. Coll. of Ed., Geography Dept.	--			X	X	pressure, rel. hum., dew pt.
54	Marquette, Mich.	Water treatment plant (Escanaba)	variable see data			1953-		
55	Marquette, Mich.	Cliffs Dow Chemical R. W Jenner, Vice Pres. and Gen. Mgr.	1957-					
56	Marquette, Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
57	Munising, Mich.	USWB cooperative	62			X	X	
58	Munising, Mich.	Water treatment plant (Escanaba)	1955-	X		X		
59	Munising, Mich.	Munising Paper Co. P. A. Haag, Plant Engr.						
60	Munising, Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b

No.	Intake location (ft.)	Hydrographic Data									
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	Remarks
		Raw	Treated					Coli.	Total		
48											
49											
50											
51											
52										lake level (cont.)	
53											
54	1000 (68)	1953-			1955-	1953-		1951-			recording thermograph
55	700 (20)	X									
56											
57											
58	-- (50)	X						X			
59	450 (40)	X									
60											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Speed	Air Temp.	Pcpn.	Other
61	Au Sable (Grand Marais), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
62	Grand Marais, Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
63	Whitefish Point, Mich.	USWB cooperative	variable see data			49	51	
64	Whitefish Point, Mich.	USCG Light (6 hrly)	--	X	X	X		p 15, 2a
65	Caribou Island, Ont.	Canada Dept. of Transport (lighthouse) CMD II	variable see data	16	16	53	53	sunshine 14, weather
66	Michipicoten Harbor, Ont.	Canadian Hydrographic Service	--					
67	Heron Bay, Ont.	CMD II	**			X	X	
68	Marathon, Ont.	CMD II	**			X	X	
69	Marathon, Ont.	Marathon Paper Co. Colin MacMillan	1947-			X	solid cover only	pressure, 1954
70	Slate Island, Ont.	Canada Dept. of Transport (lighthouse)	--	X	X			weather
71	Terrace Bay, Ont.	Kimberly-Clark Paper Co. J. Wade, Tech. Supt.	variable see data					
72	Schreiber, Ont.	CMD II	1909-			49	49	(cloud cover)

** See Appendix II, p. 160.

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
61											
62											
63											
64											
65											
66											
67											
68											
69	1600 (30)	X hourly			X 1/mo.	X 1/mo.	X 1/mo.	X 1/wk.		Ca,Mg,Fe,Cl,SO_4, 1/mo.	chem data available from J.F.J. Thomas, Head, Ind. Waters Sec., Ind. Mins. Div., Dept. Mines & Tech. Surveys, Ottawa, Ont.
70											
71	1600 (34)	1948-		55-56						plankton, 1955	
72											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp	Pcpn.	Other
73	Port Arthur, Ont.	Water treatment plant, Public Utilities Comm., E. A. Vigars, Mgr.	1938-	X		X		date of ice formation; weather
74	Port Arthur, Ont.	Canadian Hydrographic Service	--					
75	Fort William, Ont.	CMD I	**	X	X	X	X	p 15, 1
76	Isle Royale, Mich.	Mott Is. (USWB cooperative	18			X	X	
77	Isle Royale, Mich.	Washington Harbor (USWB cooperative)	20			X	X	
78	Passage Island, Mich.	USCG Light (6 hrly)	--	X	X	X		p 15, 2a

** See Appendix II, p. 160.

No.	Intake location (ft.)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
73	2400 (25)	X								complete chemical analysis of raw water made July-August, 1950	
74										water level, wave height	
75											
76											
77											
78											

ST. MARYS RIVER

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
1	Sault Ste. Marie, Mich.	Water treatment plant (Escanaba)	variable see data	1955-	1955-			(ice thickness)
2	Sault Ste. Marie, Mich.	USWB First Order	70	X	X	X	X	p 15, 1
3	Sault Ste. Marie, Mich.	USCG Lansing Shoal Light (6 hrly)	--	X	X	X		p 15, 2a
4	Sault Ste. Marie, Mich.	U. S. Lake Survey	--					
5	Sault Ste. Marie, Ont.	CMD II	**			X	X	
6	Sault Ste. Marie, Ont.	CMD II (Insectary)	**			X	X	
7	Sault Ste. Marie, Ont.	Canadian Hydrographic Service	--					
8	Point Iroquois (Brimley), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
9	Point Iroquois, Mich.	U. S. Lake Survey	--					
10	Little Rapids Cut (Sault Ste. Marie), Mich.	USCG Light Attendant (4 hrly)	--	X	X	X		p 15, 2b
11	Middle Neebish Cut (Barbeau), Mich.	USCG Light Attendant (4 hrly)	--	X	X	X		p 15, 2b

** See Appendix II, p. 160.

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
1	1300 (42)	(X)				1950-		1950-			coli. on daily basis only since 1957
2											period of record not entirely ascertained
3											
4										water level (cont.)	
5											
6											
7										water level (cont.)	
8											
9										water level (cont.)	
10											
11											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn	Other
12	Dunbar, Mich.	USWB cooperative	16			X	X	
13	Detour, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
14	Detour, Mich.	USCG Light Attendant (4 hrly)	--	X	X	X		p 15, 2b
15	Detour, Mich.	USWB cooperative	28				X	
16	Detour, Mich.	U. S. Lake Survey	--					

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
12											
13											
14											
15											
16										water level (cont.)	

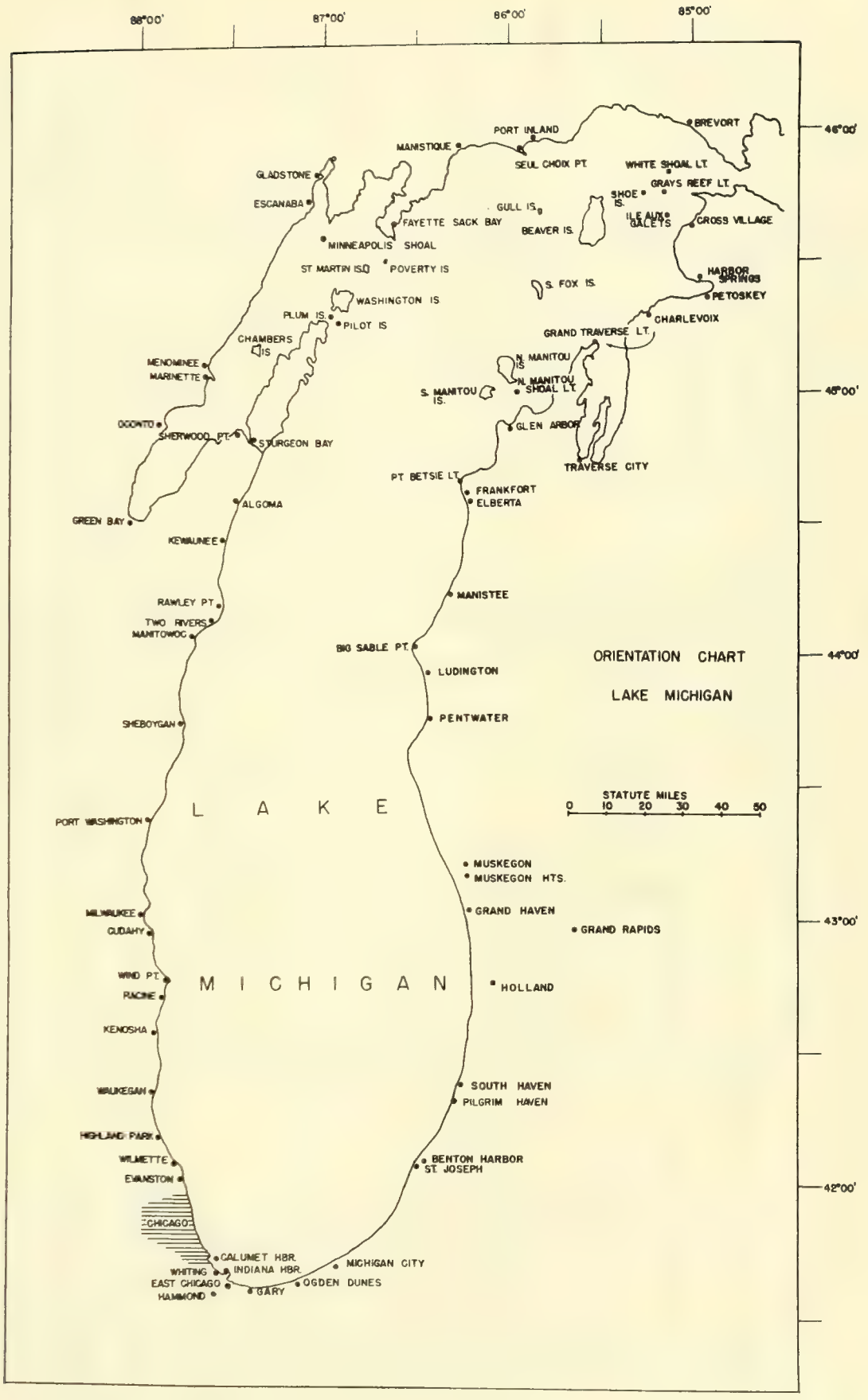

Figure 3. Orientation Chart, Lake Michigan

LAKE MICHIGAN (beginning on the north shore at the Straits of Mackinac and proceeding counterclockwise)

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
1	Brevort, Mich.	USWB cooperative	5				X	
2	Port Inland, Mich.	USWB cooperative	5				X	
3	Seul Choix Point (Gulliver), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
4	Manistique, Mich.	USWB cooperative	22			X	X	
5	Manistique, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
6	Fayette Sack Bay, Mich.	USWB cooperative	38			X	X	
7	Gladstone, Mich.	Water treatment plant (Escanaba)	variable see data	(X)		1935-		
8	Escanaba, Mich.	USWB First Order	87	X	X	X	X	p 15, 1
9	Escanaba, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
10	Escanaba, Mich.	Water treatment plant (Escanaba)	variable see data	1953-	1957-	1946-		
11	Minneapolis Shoal, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
12	Menominee, Mich.	Water treatment plant	variable see data	ca 1880—		ca 1880-	ca 1880-	ice formation & dissipation ca 1880-
13	Menominee, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
1											
2											
3											
4											
5											
6											
7	1500 (35)	1955-						1954-		color, 1954-	
8											
9											
10	-- (--)	1953-		1953-	1953-	1954-	1953-	1948-	1948-	odor, 1948-; color, 1948-	
11											
12	conflicting info.	1945-		1951-	1945-	1945-	(X)	1945-	1945-	color, 1945-	
13											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
14	Marinette, Wisc.	Water treatment plant	--					
15	Marinette, Wisc.	USWB cooperative	40			X	X	
16	Oconto, Wisc.	USWB cooperative	variable see data			69	48	
17	Green Bay, Wisc.	Water treatment plant A. Marx, Chemist	1957-	X	X	X		weather
18	Green Bay, Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
19	Green Bay, Wisc.	USCG Light Attendant (4 hrly)	--	X	X	X		p 15, 2b
20	Green Bay, Wisc.	U. S. Lake Survey	--					
21	Sherwood Point (Sturgeon Bay), Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
22	Chambers Island (Fish Creek), Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
23	Plum Island, Wisc. (c/o Washington Is.)	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
24	Pilot Island (Washington Is.), Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
25	St. Martin Island (Washington Is.), Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
14											
15											
16											
17	6000 (47)	X		X	X	X	X	X	X		intake in L. Michigan approx. 3 mi N of Kewaunee; USPH cooperator
18											
19											
20										lake level (cont.)	
21											
22											
23											
24											
25											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
26	Poverty Is. (Washington Is.), Wisc.	USCG Light (4 hrly)	-	X	X	X		p 15, 2b
27	Washington Is., Wisc.	USWB cooperative	14			X	X	
28	Sturgeon Bay, Wisc.	USWB cooperative	variable see data			61	54	
29	Sturgeon Bay, Wisc.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
30	Sturgeon Bay, Wisc.	U. S. Lake Survey	--					
31	Algoma, Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
32	Kewaunee, Wisc.	USWB cooperative	46			X	X	
33	Kewaunee, Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
34	Rawley Point (Two Rivers), Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
35	Two Rivers, Wisc.	Water treatment plant (USWB cooperative)	variable see data			8	8	
36	Two Rivers, Wisc.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
37	Manitowoc, Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
38	Manitowoc, Wisc.	USWB cooperative	variable see data			75	96	

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
26											
27											
28											
29											
30										lake level (cont.)	
31											
32											
33											
34											
35	6123 (33)	1933-		1933-	1933-	1933-					
36											
37											
38											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
39	Sheboygan, Wisc.	Water treatment plant C. Blabaum, Plant Supt.	1931-	X	X	X		weather, lake current dir. during 1958
40	Sheboygan, Wisc.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
41	Sheboygan, Wisc.	USWB cooperative	variable see data			62	60	
42	Port Washington, Wisc.	Water treatment plant	1949-	X		X		
43	Port Washington, Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
44	Port Washington, Wisc.	USWB cooperative	19				X	
45	Milwaukee, Wisc.	Water treatment plant T. E. Dolan, Chemist	variable see data	1958	1958	1958		weather, lake current dir. 1958
46	Milwaukee, Wisc.	USWB cooperative	7			X	X	
47	Milwaukee, Wisc.	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
48	Milwaukee, Wisc.	USWB First Order City	84	X	X	X	X	p 15, 1
49	Milwaukee, Wisc.	U. S. Lake Survey	--					
50	Cudahy, Wisc.	Water treatment plant J. J. Tiry, Director Pub. Works	1954-	X	X	X		

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
39	5000 (-) 1800 (-)	X		X	X	X					5000 ft intake used most USPH cooperator
40											
41											
42	3450 (32)	X		X	X	X		X	X		
43											
44											
45	6500 (67)	X		X	X	X		X	X	plankton	USPH cooperator
46											
47											
48											
49										lake level (cont.)	
50	2400 (24)	X		X	X	X		X	X		

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
51	Wind Point, Wisc.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
52	Racine, Wisc.	Water treatment plant G. H. Ruston, Mgr.	1930-	X		X	X	
53	Racine, Wisc.	USWB cooperative	variable see data			65	62	
54	Kenosha, Wisc.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
55	Kenosha, Wisc.	USWB cooperative	16			X	X	
56	Waukegan, Ill.	North Shore Sanitary Dist., R. E. Anderson, Chem-Engr.						
		(a) Waukegan Disposal Plant	variable see data	1947-			liquid 1938-; solid 1947-1952	cloud cover 1947-48
57-76	Waukegan, Ill.	(b) 20 obs. pts. between Wisc. & Cook Co., Ill., borders	1948-	X	X			weather, lake condition
77	Waukegan, Ill.	Water treatment plant H. C. Domke, Supt.	1928-	X	X			atmos. cond. lake level
78	Waukegan, Ill.	USWB cooperative	35			X	X	
79	Waukegan, Ill.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
80	Highland Park, Ill.	Water treatment plant	1929-			X		atmos. cond.

No.	Intake location (ft)	Hydrographic Data								Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
51											
52	3960 (40)	X		X	X	X		X	X		
53											
54											
55											
56											
57-76		X			X	X		X			locations of obs. pts. obtainable from R. E. Anderson
77	-- (--)	X		X	X	X		X	X		USPH cooperator
78											
79											
80	3400 (25) 2000 (25)	X		X	X	X		X	X		

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
81	Wilmette, Ill.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
82	Evanston, Ill.	Water treatment plant H. R. Frye, Supt.	1913-	X	X	X	X	
83	Evanston, Ill.	USWB cooperative	17				X	
84	Chicago, Ill.	USWB First Order City	88	X	X	X	X	p 15, 1
85	Chicago, Ill.	Chicago Univ. USWB cooperative	87	X	X	X	X	
86	Chicago, Ill.	Loyola Univ. USWB cooperative	25			X	X	
87	Chicago, Ill.	Chicago Lakeview Pump. Sta. (USWB cooperative)	25				X	
88	Chicago, Ill.	Chicago Sanitary Dist. Off. (USWB cooperative)	32				X	
89	Chicago, Ill.	South Dist. Filtration Plt. (USWB cooperative) J. R. Baylis, Engr. of Water Purification	1945-	X	X	X	X	
90	Chicago, Ill.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
91	Chicago, Ill.	U. S. Lake Survey	--					
92	Jackson Park (Chicago), Ill.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
81											
82	5690 (16)	X		X	X	X		X	X	plankton	USPH cooperator
83											
84											
85											
86											
87											
88											
89	-- (--)	X		X	X	X		X	X	plankton, lake level	USPH cooperator
90											
91											
92											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
93	South Chicago, Ill.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
94	Hammond, Ind.	Water treatment plant M. Papach, Act. Supt.	1936-	X	X	X		visibility
95	Whiting, Ind.	USWB cooperative	48			X	X	
96	Whiting, Ind.	Water treatment plant M. H. Abraham, Supt.	1955-	X				
97	Indiana Harbor, Ind.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
98	Gary, Ind.	USWB cooperative	22			X	X	
99	Gary, Ind. (Gary-Hobart)	Water treatment plant H. L. Plowman, Jr., Ch. Chem.	1954-	X		X		
100	Gary, Ind.	U. S. Steel; T. W. Hunter, Gen. Supt.; D. T. Seaman, Div. Supt. of Power & Fuel	variable see data					
101	Gary, Ind.	Northern Ind. Public Serv. Co., D. H. Mitchell Plant, E. B. Heise, Mgr. Electric Production	Dec. 1956-	X	X	X		
102	Ogden Dunes, Ind.	USWB cooperative	7			X	X	
103	Michigan City, Ind.	Water treatment plant D. Ungareit, Pl. Supt.	1935-	X				atmos. cond.

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
93											
94	1)5000(24) 2)1934(17) 3)1400(15)	X		X	X	X		X		odor; lake surface	intakes: 1) used all yr; 2) & 3) used May-Sept.
95											
96	1696 (16)	X				X					
97											
98											
99	ca 6000 (35-38)	X		X	X	X	X	X	X	plankton, color, odor	USPH cooperator
100	1) 2900 (6-16) 2) 100 (-)	1950-					1953-			Ca, Mg, non-CO_3 salts, 1953-	
101	shoreline (6)	X								unspecified chem. anal.;water level	
102											
103	3000 (35)	X		X	X	X		X	X		2 intakes at same location; 24" & 42"diam. USPH cooperator

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
104	Michigan City, Ind.	Northern Ind. Public Serv. Co., Michigan City Plant; E. B. Heise, Mgr. Electric Production	1931-	X	X	X		
105	Michigan City, Ind.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
106	St. Joseph, Mich.	Water treatment plant (Lansing)	1952-					
107	St. Joseph, Mich.	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
108	Benton Harbor, Mich.	Water treatment plant (Lansing)	1951-	X	X	X		
109	Benton Harbor, Mich.	USWB cooperative	75			X	X	
110	Pilgrim Haven, Mich.	C. W. Shinn	3	X	X	X	X	pressure
111	South Haven, Mich.	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
112	South Haven, Mich.	Water treatment plant (Lansing)	1926-	X				
113	South Haven, Mich.	USWB cooperative	63			X	X	
114	South Haven, Mich.	Municipal power plant Roy Ewers, Mgr.	1915-					pressure
115	Holland, Mich.	Water treatment plant (Lansing)	1957-	X		X		

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
104	shoreline (14)	X								unspecified chem. anal., water level	
105											
106	1500 (25)	X		X		X		X		odor	
107											
108	3500 (28)	X		X	X	X	X	X	X	odor	USPH cooperator
109											
110											
111											
112	5600 (35)	X		X	X	X		X	X	color, odor	
113											
114											
115	4360 (46-50)	X		X	X	X		X	X	plankton, odor, CO_3, diss. CO_2, HCO_3	USPH cooperator

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
116	Holland, Mich.	USCG Moorings (4 hrly)	--	X	X	X		p 15, 2b
117	Grand Rapids, Mich.	Water treatment plant (Lansing)	1912-					
118	Grand Haven, Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
119	Grand Haven, Mich.	USWB cooperative	16				X	
120	Grand Haven, Mich.	USWB cooperative	88			X	X	
121	Muskegon Heights, Mich.	Water treatment plant (Lansing)	1941-	X				
122	Muskegon, Mich.	Water treatment plant (Lansing)	1937-			X		
123	Muskegon, Mich.	USWB First Order	62	X	X	X	X	p 15, 1
124	Muskegon, Mich.	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
125	Pentwater, Mich.	USCG Moorings (4 hrly)	--	X	X	X		p 15, 2b
126	Ludington, Mich.	Water treatment plant (Lansing)	1954-	X				weather
127	Ludington, Mich.	USWB cooperative	--			X	X	
128	Ludington, Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
129	Ludington, Mich.	USWB cooperative	62			X	X	

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
116											
117	6100 (57)	X		X	X	X	X	X	X	plankton, Mg, Cl, color	USPH cooperator
118											
119											
120											
121	4600 (42)		X	X	X	X	X	X	X	color, odor	
122	7000 (50)	X		X	X	X		X	X	Fl, Cl, color, odor	USPH cooperator
123											
124											
125											
126	2600 (45)	X				X		X			
127											
128											
129											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind		Air	Pcpn.	Other
				Dir.	Speed	Temp.		
130	Ludington, Mich.	U. S. Lake Survey	--					
131	Big Sable Point (Ludington), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
132	Manistee, Mich.	USWB cooperative	63			X	X	
133	Manistee, Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
134	Elberta, Mich.	USWB cooperative	56			X	X	
135	Frankfort, Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
136	Point Betsie, Mich.	USCG Light (6 hrly)	--	X	X	X		p 15, 2a
137	Glen Arbor, Mich.	USWB cooperative	4			X	X	
138	South Manitou Is., Mich.	USCG Light (6 hrly)	--	X	X	X		p 15, 2a
139	North Manitou Is., Mich.	USWB cooperative	4			X	X	
140	North Manitou Is., Mich.	USWB cooperative	--			X	X	
141	North Manitou Shoals (Leland), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
142	Grand Traverse (Northport), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli	Total		
130										lake level (cont.)	
131											
132											
133											
134											
135											
136											
137											
138											
139											
140											
141											
142											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
143	Traverse City, Mich.	Water treatment plant (Lansing)	1954-					
144	Traverse City, Mich.	USWB Second Order CAA AP	64	X	X	X	X	p 15, 1
145	Traverse City, Mich.	Naval Air Station	1942-1945	X	X	X	X	p 15, 1
146	Charlevoix, Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
147	Charlevoix, Mich.	USWB cooperative	71				X	
148	Petoskey, Mich.	Penn-Dixie Portland Cement Co., G. Davis, Supt.	--					
149	Petoskey, Mich.	USWB cooperative	6			X	X	
150	Little Traverse (Harbor Springs), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
151	Cross Village, Mich.	USWB cooperative	5				X	
152	White Shoal (Cross Village), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
153	Lansing Shoal, Mich.	USCG Light (6 hrly)	--	X	X	X		p 15, 2a
154	Grays Reef (Charlevoix), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
155	Ile Aux Galets (Charlevoix), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
143	1700 (34)	X				X		X			
144											
145											
146											
147											
148	50 (6)	X									
149											
150											
151											
152											
153											
154											
155											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
156	Beaver Is., Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
157	Beaver Is., Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
158	Beaver Is., Mich.	USWB cooperative	--			X	X	
159	Gull Is., Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
160	South Fox Is., Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
161	Shoe Island, Mich.	USWB cooperative	--			X	X	

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
156											
157											
158											
159											
160											
161											

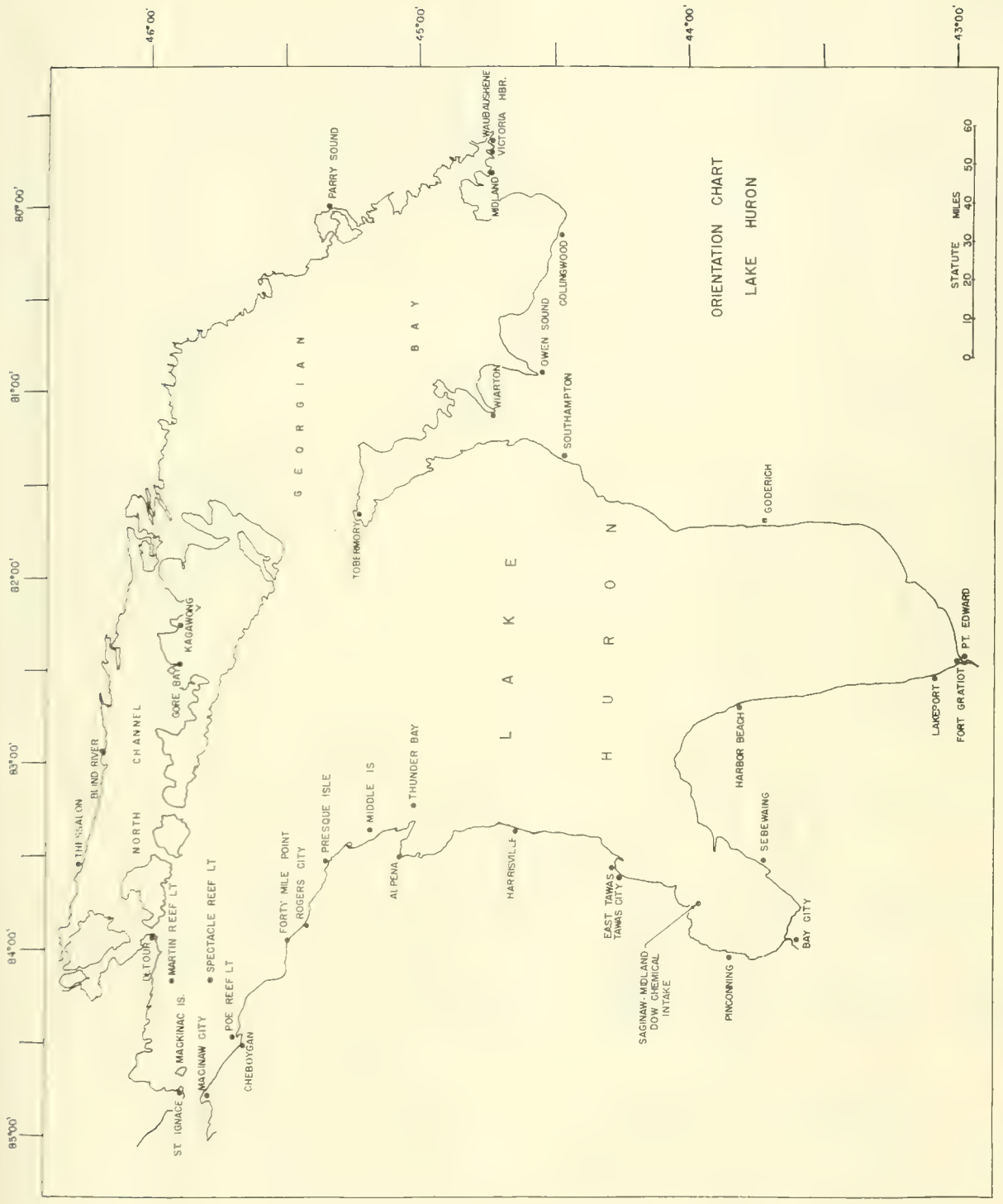

Figure 4. Orientation Chart, Lake Huron

LAKE HURON (starting at international boundary at False Detour Passage and proceeding counterclockwise)

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
1	Martin Reef, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
2	St. Ignace, Mich.	Water treatment plant (Escanaba)	variable see data	1951-		1956-		weather (recent data)
3	Mackinac Is., Mich.	Water treatment plant (Escanaba)	variable see data					
4	Mackinac Is., Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
5	Mackinaw City, Mich.	USWB cooperative	68	X	X	X	X	
6	Mackinaw City, Mich.	U. S. Lake Survey	--					
7	Cheboygan, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
8	Cheboygan, Mich.	USWB cooperative	69				X	
9	Poe Reef (Cheboygan), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
10	Spectacle Reef (Cheboygan), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
11	Forty Mile Point (Rogers City), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
12	Rogers City, Mich.	USWB cooperative	7			X	X	

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
1											
2	before 1955: 225 (13) since 1955: 480 (20)	1951-			1952-	1952-		1950-			temps prior to 1951 obs. with unreliable thermometer
3	-- (--)					1957-		1946-			
4											
5											
6										lake level (cont.)	
7											
8											
9											
10											
11											
12											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
13	Rogers City, Mich.	Mich Limestone and Chem. Div., U.S. Steel D. T. Van Zandt, Mgr.	"Several years"					
14	Presque Isle, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
15	Middle Is. (Alpena), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
16	Thunder Bay Is. (Alpena), Mich.	USCG Light (6 hrly)	--	X	X	X		p 15, 2a
17	Alpena, Mich.	USWB First Order	86	X	X	X	X	p 15, 1
18	Alpena, Mich.	Water treatment plant (Lansing)	1945-	X				
19	Alpena, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
20	Harrisville, Mich.	USWB cooperative	79			X	X	
21	East Tawas, Mich.	USWB cooperative	64			X	X	
22	Tawas City, Mich.	USCG Tawas Point Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
23	Saginaw-Midland intake, Mich.	Water treatment plant (Lansing)	1948-					
24	Midland, Mich.	Dow Chemical Co. M. Whiting, Mgr., Service Depts.	1949-	X	X	X	X	rel. humid.

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb	Hard.	Bacteria		Other	
		Raw	Treated					Coli	Total		
13	shoreline (6)	X								"chemical anal." of raw water made once per year	
14											
15											
16											
17											
18	2000 (10)		X	X	X	X	X	X		color	
19											
20											
21											
22											
23	Whitestone Pt., north shore Saginaw Bay; (40)	X		X	X	X	X	X	X	free CO_2, Mg, Cl, color	
24	(see remarks)	X		X	X	X	X			Cl, SO_4, Si, Na	same intake as Saginaw-Midland

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
25	Pinconning, Mich.	Water treatment plant (Lansing)	1948-	X				
26	Bay City, Mich.	Water treatment plant (Lansing)	1925-	X				
27	Bay City, Mich.	USWB cooperative	63			X	X	
28	Bay City, Mich.	USCG Saginaw River Range Light (6 hrly)	--	X	X	X		p 15, 2a
29	Bay City, Mich.	U. S. Lake Survey	--					
30	Sebewaing, Mich.	USWB cooperative	2				X	
31	Harbor Beach, Mich.	Water treatment plant (Lansing)	1937-					
32	Harbor Beach, Mich.	U. S. Lake Survey	--					
33	Harbor Beach, Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
34	Lakeport, Mich.	U. S. Lake Survey	--					
35	Fort Gratiot, Mich.	U. S. Lake Survey	--					
36	Point Edward, Ontario	Canadian Hydrographic Service	--					
37	Goderich, Ontario	CMD II	variable see data **			(X)	57	

** See Appendix II, p. 160.

No.	Intake location (ft)	Hydrographic Data								Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
25	5400 (6)		X	X	X			X		Cl, odor	
26	18480 (19)		X	X	X	X	X	X	X	Mg, Cl, free CO_2, color, odor	
27											
28											
29										lake level (cont.)	
30											
31	2600 (14)		X	X	X	X		X	X	color, odor	
32										lake level (cont.)	
33											
34										lake level (cont.)	
35										lake level (cont.)	
36										lake level (cont.)	
37											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
38	Goderich, Ontario	Canadian Hydrographic Service	--					
39	Southampton, Ontario	CMD II	variable see data	28	28	81	81	
40	Tobermory, Ontario	CMD II	variable see data			43	43	
41	Wiarton, Ontario	CMD I	**	X	X	X	X	p 15, 1
42	Owen Sound, Ontario	CMD II	variable see data			76	76	
43	Collingwood, Ontario	CMD II	**			X	X	
44	Collingwood, Ontario	Canadian Hydrographic Service	--					
45	Midland, Ontario	CMD III	**				X	
46	Victoria Harbor, Ont.	CMD III	**				X	
47	Waubaushene, Ontario	CMD II	**			X	X	
48	Parry Sound, Ontario	CMD II	variable see data	28	28	63	63	
49	Kagawong, Ontario	CMD II	**			X	X	
50	Gore Bay, Ontario	CMD I	**	X	X	X	X	p 15, 1

** See Appendix II, p. 160.

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
38										lake level (cont.)	
39											
40											
41											
42											
43											
44										lake level (cont.)	
45											
46											
47											
48											
49											
50											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
51	Gore Bay, Ontario	CMD II	variable see data	10	10	43	43	
52	Blind River, Ontario	CMD II	variable see data			15	15	
53	Thessalon, Ontario	Canadian Hydrographic Service	--					

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
51											
52											
53										lake level (cont.)	

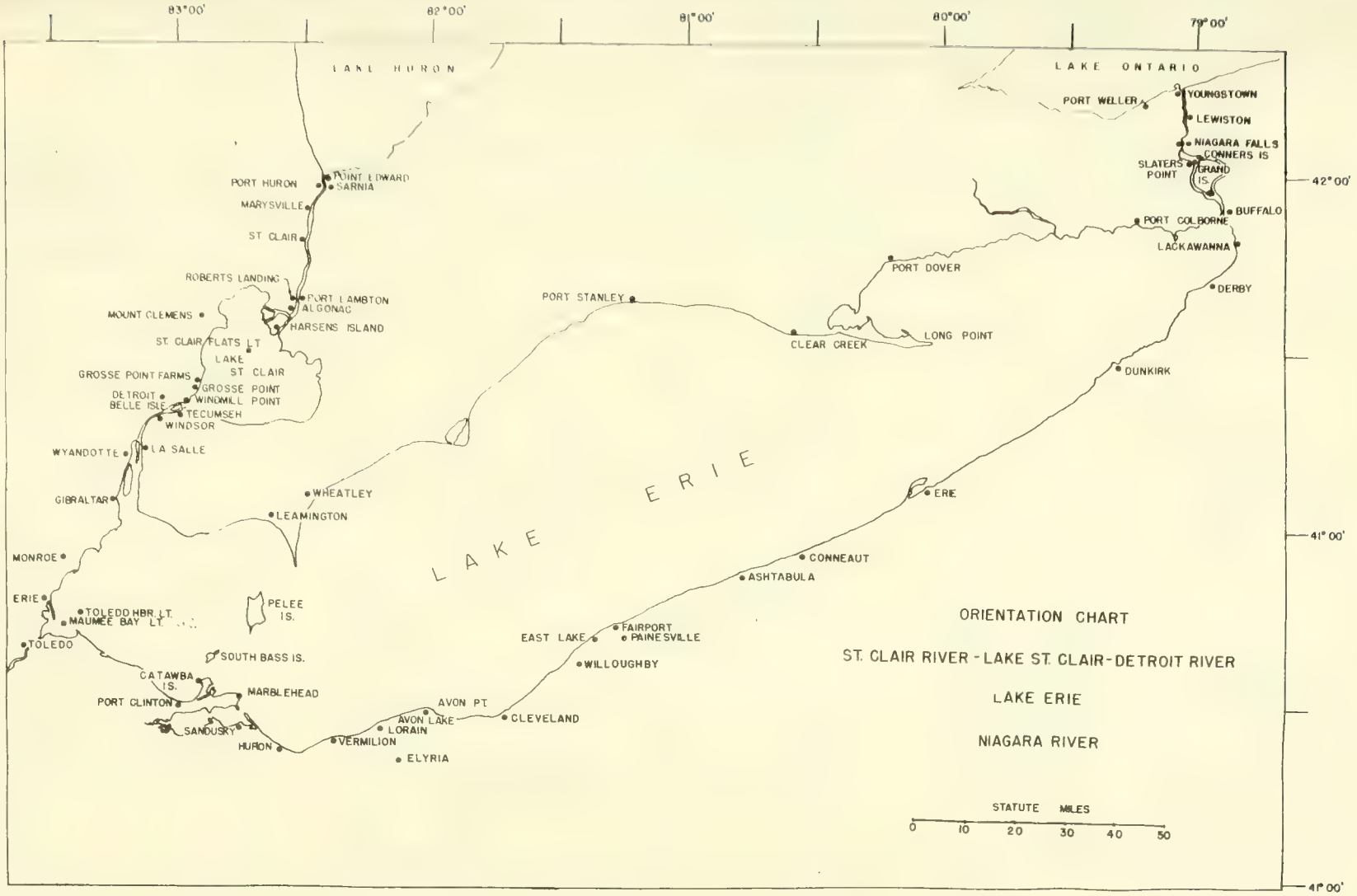

Figure 5. Orientation Chart, Lake Erie (including St. Clair River, Lake St. Clair, Detroit River, and Niagara River)

ST. CLAIR RIVER-LAKE ST. CLAIR-DETROIT RIVER (starting at the southern extreme of Lake Huron)

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
1	Port Huron, Mich.	Water treatment plant (Lansing)	1954-					
2	Port Huron, Mich.	U. S. Lake Survey	--					
3	Port Huron, Mich.	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
4	Sarnia, Ontario	Polymer Corp., Ltd. I. C. Rush, Mgr., Tech. Div.	variable see data	1949-	1949-	1949-	1949-	cloud cover, 1949- pressure, 1957-
4a	Sarnia, Ontario	CMD II	variable see data	3	3	41	41	
5	Marysville, Mich.	Detroit Edison Plant W. W. Williams, Mgr. of Operations, Detroit	1953- possibly earlier					
6	St. Clair, Mich.	Detroit Edison Plant W. W. Williams, Mgr. of Operations, Detroit	1953- possibly earlier					
7	Roberts Landing, Mich.	U. S. Lake Survey	--					
8	Port Lambton, Ontario	Canadian Hydrographic Service	--					
9	Algonac, Mich.	U. S. Lake Survey	--					
10	Harsens Is., Mich.	U. S. Lake Survey	--					
11	Mt. Clemens, Mich.	Water treatment plant (Lansing)	1929-	X				

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
1	-- (--)					X		X			
2										water level (cont.)	
3											
4	--	1956-									water temp. records discarded after two yrs.
4a											
5	--	X								water level	
6	--	X								water level	
7										water level (bi-daily)	
8										water level (cont.)	
9										water level (cont.)	
10										water level (tri-daily)	
11	5000 (16)		X	X	X	X	X	X		color, odor	

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
12	Mt. Clemens, Mich.	Selfridge Air Force Base	59	X	X	X	X	p 15, 1
13	St. Clair Flats (Sans Souci), Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
14	Grosse Point Farms, Mich.	Water treatment plant (Lansing)	1931-					
15	Grosse Point, Mich.	U. S. Lake Survey	--					
16	Windmill Point, Mich.	U. S. Lake Survey	--					
17	Tecumseh, Ontario	Canadian Hydrographic Service	--					
18	Windsor, Ontario	Water treatment plant G. H. Strickland, Supt.	variable see data			1930-		
19	Windsor, Ontario	Hydro-Electric Power Comm. of Ontario, J. C. Keith, Plant R. Shepley, Sta. Supt.	variable see data					
20	Detroit, Mich.	Water treatment plant (Water Works Park) (Lansing)	1924-	X				
21-24	Detroit, Mich.	Detroit Edison Plants: Conners Creek, Delray, River Rouge, Trenton Channel W. W. Williams, Mgr. of Oper., Detroit	1953- possibly earlier					

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
12											
13											
14	2000 (14-16)		X	X	X	X		X	X	odor	alk, pH reported rarely
15										water level (cont.)	
16										water level (cont.)	
17										water level (cont.)	
18	1926-1954: 350 (40) 1954-: 300 (40)	1930-		1950-	1950-	1928-	1950-	1930-	1930-	taste, odor, 1928- plankton, 1930- water level, 1956-	
19	see remks.	1952-		1955-	1955-		1955-			Cl, conductivity, 1955-	intake is channel dredged ca 15 ft deep 140 ft from shore
20	-- (26)		X	X	X	X		X	X	odor, plankton	
21-24	--	X								water level	

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
25	Detroit, Mich.	U. S. Lake Survey	--					
26	La Salle, Ontario	Canadian Hydrographic Service	--					
27	Wyandotte, Mich.	Water treatment plant (Lansing)	1946-	X	X			pressure, cloud cover
28	Wyandotte, Mich.	Wyandotte Chemical Corp. J. F. Hunter, Pollution Control Engineer	variable see data					
29	Wyandotte, Mich.	U. S. Lake Survey	--					
30	Belle Isle, Mich.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
31	Grosse Ile, Mich.	Naval Air Station	1942-	X	X	X	X	p 15, 1
32	Gibraltar, Mich.	U. S. Lake Survey	--					
33	Gibraltar, Mich.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b

No.	Intake location (ft)	Hydrographic Data								Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
25										water level (cont.)	
26										water level (cont.)	
27	1800 (25)	X		X	X	X	X	X	X	Cl, Fl, odor	total bact. discont. after 1956
28	--	1950-		1937-			1937-			Cl, Ca, 1937-	
29										water level (cont.)	
30											
31											
32										water level (cont.)	
33											

LAKE ERIE (starting on United States side at mouth of Detroit River and proceeding counterclockwise)

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
1	Monroe, Mich.	Water treatment plant (Lansing)	1937-	X				
2	Monroe, Mich.	Univ. of Mich. Research	1956-	X	X	X	X	lapse rate
3	Monroe, Mich.	USWB cooperative	41			X	X	
4	Monroe, Mich.	U. S. Lake Survey	--					
5	Erie, Mich.	Consumers Power Co., M. C. Stiff, Electric Prod. Supt., Jackson, Mich.	1955-56-					
6	Toledo, Ohio	Water treatment plant R. R. Henderson, Supt. (Columbus)	1941-					
7	Toledo, Ohio	Interlake Iron Corp. J. L. Johnson, Gen. Supt.	variable see data		(X)	1953-		humidity, 1953- pressure, 1953-
8	Toledo, Ohio	Toledo Edison Co., Bay Shore Plant J. S. Grant, Chief Chemist	1952-53 1956-					
9	Toledo, Ohio	USWB cooperative	9			X	X	

No.	Intake location (ft)	Hydrographic Data								Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
1	5360 (23)		X	X	X	X	X	X	X	Ca, Mg, odor	
2											
3											
4										lake level (cont.)	
5	see remarks	X (summer only)		X	X	X	X			conductivity, surf. tension, susp. solids, diss. solids, total solids, Ca, Cl, Mg, Fe, Cu, Mn, Na, K, N, NH_3, NO_3, SiO_2, SO_4, Al_2O_3, CO_2, O_2 consumed, loss of solids by ignition, phenols, sulfides, odor	intake in 15-19 ft deep dredged channel originating at end of, and enclosed by, a N-S peninsula
6	10560 (10)			X	X	X	X	X	X	Mg	
7	shore line (0.4 to 13.4 ft.)	1 yr.		(X)	(X)		(X)			lake level, 1 yr.	intake figs re to water level of 570.15 ft.
8	--	X								unspecified "chemical data"	no winter temp data
9											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
10	Toledo, Ohio	USWB cooperative	7			X	X	
11	Toledo, Ohio	U. S. Lake Survey	--					
12	Toledo Harbor, Ohio	USCG Light (6 hrly)	--	X	X	X		p 15, 2a
13	Maumee Bay (Toledo), Ohio	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
14	Port Clinton, Ohio	Water treatment plant W. F. Crohen, Supt. (Columbus)	1912-					
15	Catawba Is., Ohio	USWB cooperative	variable see data			42	41	
16	South Bass Is. (Put-in-Bay), Ohio	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
17	Gibraltar Is. (South Bass Is.), Ohio	USWB cooperative	variable see data			42	41	
18	Marblehead, Ohio	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
19	Sandusky, Ohio	Water treatment plant O. F. Schoepfle, Supt. (Columbus)	1910-					
20	Sandusky, Ohio	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
21	Sandusky, Ohio	USWB First Order	81	X	X	X	X	p 15, 1

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
10											
11										lake level (cont.)	
12											
13											
14	1000 (0-8)			X	X	X	X	X	X		variable intake depth due to observed fluctuations in lake level (per plant supt.)
15											
16											
17											
18											
19	2500 (19.5)			X	X	X		X	X		
20											
21											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
22	Huron, Ohio	Water treatment plant S. R. Hetrick, Supt. (Columbus)	1909-					weather
23	Huron, Ohio	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
24	Vermilion, Ohio	Water treatment plant W. K. Eisenhauer, Supt. (Columbus)	1916-					
25	Lorain, Ohio	Water treatment plant G. Walkenshaw, Supt. (Columbus)	1910-	X		X		weather, lake surface
26	Lorain, Ohio	Ohio Edison Co., Edgewater Plant J. W. Mikels, Gen. Supt. of Power Production	variable see data	1956- (see remarks)	1956- (see remarks)			
27	Lorain, Ohio	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
28	Elyria, Ohio	Water treatment plant N. J. Humason, Supt. (Columbus)	1903-					
29	Avon Lake, Ohio	Water treatment plant R. R. Underhill, Supt. (Columbus)	1928-					
30	Avon Point, Ohio	Cleveland Elec. and Illum. Co., Avon Plant, C. A. Dauber, Dir. Civil & Mech. Engr., Cleveland	variable see data	1956-	1956-	1956-		humidity, 1956-

No.	Intake location (ft)	Hydrographic Data								Other	Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria			
		Raw	Treated					Coli.	Total		
22	1000 (13	X		X	X	X	X	X			
23											
24	1904-50: 1300 (8) 1950-: 1300 (12)	X		X	X	X	X	X	X		
25	2000 (--)	X		X	X	X	X	X	X		
26	see remarks	1948-								water level 1948-	intake is 800 ft channel 30 ft wide, 8-10 ft deep meteorological data on file at Battelle Memorial Inst., Columbus, O.; letter of release needed from Ohio Ed.
27											
28	1500 (ca 13)	X		X	X	X	X	X	X		
29	1200 (15)			X		X		X			
30	see remarks	X									intake is 1000 ft channel dredged to 18 ft depth

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
31	Cleveland, Ohio	Water treatment plant F. J. Schwemler, Commissioner of Water; Columbus	1917-					
32	Cleveland, Ohio	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
33	Cleveland, Ohio	USWB cooperative (Cleveland Easterly Sewage Pl.)	3				X	
34	Cleveland, Ohio	USWB cooperative (Euclid Ave.)	14			X	X	pressure
35	Cleveland, Ohio	Cleveland Electric & Illuminating Co., Lake Shore Plant (5 mi. E downtown Cleveland) C. A. Dauber, Dir. Civil & Mech. Engr., Cleveland	1932-					
36	Cleveland, Ohio	U. S. Lake Survey	--					
37	East Lake, Ohio	Cleveland Electric & Illuminating Co., East Lake Plant, C. A. Dauber, Dir. Civil & Mech. Engr., Cleveland	variable see data	1955-	1955-			
38	Willoughby, Ohio	USWB cooperative	53				X	
39	Fairport, Ohio	Water treatment plant E. Thomas, Supt. (Columbus)	1936-					

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
31	see remarks			X	X	X	X	X	X	Mg	4 plants, with intakes: Div. Ave.: 4 mi. (36) Baldwin: 4 mi. (28) Nottingham: 3.5 mi. (40) Clague Rd. (under const.) 2.5 mi. (35)
32											
33											
34											
35	see remarks	X									intake is "very short" dredged chan.
36										lake level (cont.)	
37	see remarks	1953-									intake is 1000 ft channel dredged to 18 ft depth
38											
39	1000 (12)			X	X	X	X	X	X	Cl	

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
40	Fairport, Ohio	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
41	Painesville, Ohio	Water treatment plant E. W. Russell, Supt. (Columbus)	1914-					
42	Painesville, Ohio	Diamond Alkali Co., R. E. Frey, Asst. Works Mgr.	1945-					
43	Painesville, Ohio	USWB cooperative	9			X	X	
44	Ashtabula, Ohio	Water treatment plant F. J. Hull, Chemist (Columbus)	1909-					
45	Ashtabula, Ohio	Cleveland Elec. & Illum. Co., Ashtabula Plt., C. A. Dauber, Dir. Civil & Mech. Engr., Cleveland	1930-					
46	Ashtabula, Ohio	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
47	Conneaut, Ohio	Water treatment plant W. V. Kantola, Supt. (Columbus)	1900-					
48	Conneaut, Ohio	USWB cooperative	19				X	
49	Conneaut, Ohio	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
50	Erie, Pennsylvania	Water treatment plant J. D. Johnson, Gen. Supt.	--					

No.	Intake location (ft)	Hydrographic Data								Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
40											
41	1914-57: 1000 (8) 1957-: 4000 (16)	X		X	X	X	X	X	X	Cl	
42	3488 (22)	X								HCO_3, Cl, CO_3, Ca, Mg, Na, SiO_2, loss on ignition, total solids	
43											
44	1500 (25)			X	X	X	X	X	X		
45	see remarks	X									intake is 1000 ft channel dredged to 18 ft depth
46											
47	see remarks			X	X	X	X	X	X		present intake in use since 1934: 1500 (16). No info on prev. intk.
48											
49											
50	5200 (22)			X		X		X		color, OCCASIONAL ANALY: Fe, Ca, Mg, Na, NO_3, Cl, chlorinity, total slds.	

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
51	Erie, Pennsylvania	USWB First Order Ap.	6	X	X	X	X	p 15, 1
52	Erie, Pennsylvania	USWB First Order City	79	X	X	X	X	p 15, 1
53	Erie, Pennsylvania	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
54	Erie, Pennsylvania	U. S. Lake Survey	--					
55	Dunkirk, N. Y.	Niagara Mohawk Power Corp. Dunkirk Station P. A. Burt, Supt.	1950-			X	X	
56	Dunkirk, N. Y.	USWB cooperative	5				X	
57	Dunkirk, N. Y.	U. S. Lake Survey	--					
58	Dunkirk, N. Y.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
59	Derby, N. Y.	USWB cooperative	14			X	X	
60	Lackawanna, N. Y.	Erie County Water Auth. H. S. Dewey, Adm. Dir., Ellicott Square Bldg., Buffalo 3, N. Y.	variable see data					
61	Buffalo, N. Y.	USCG Base (6 hrly)	--	X	X	X		p 15, 2a
62	Buffalo, N. Y.	U. S. Lake Survey	--					
63	Port Colborne, Ontario	Canadian Hydrographic Service	--					

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
51											
52											
53											
54										lake level (cont.)	
55	at breakwall (see remarks)	X			X	X	X			conductivity, SO_2, SO_4, Cl, HCO_3, lake level	intake samples entire water column between 8 and 21 feet
56											
57										lake level (cont.)	
58											
59											
60	-- (--)			1926-	1926-	1928-	1926-	1926-	1926-	color, odor, 1928-summer plankton, 1930-	
61											
62										lake level (cont.)	
63										lake level (cont.)	

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
64	Port Dover, Ontario	CMD II	variable see data			80	80	
65	Long Point, Ontario	CMD II	variable see data	32	32	40	40	
66	Clear Creek, Ontario	CMD I	**	X	X	X	X	p 15, 1
67	Port Stanley, Ontario	Canadian Hydrographic Service	--					
68	Wheatley, Ontario	Ont. Dept. Lands & Forests Station Dr. D. V. Anderson, Maple, Ontario	--					
69	Leamington, Ohtario	CMD II	variable see data			42	42	
70	Pelee Is., Ontario	CMD II	variable see data			67	67	

** See Appendix II, p. 160.

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
64											
65											
66											
67										lake level (cont.)	
68		X									recording thermograph at station
69											
70											

NIAGARA RIVER (proceeding south to north)

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
1	Grand Is. (Tonawanda), N. Y.	Niagara Mohawk Power Corp., Huntley Station W. G. Godfrey, Supt.	1948-					
2	Slater's Point, Ontario	Canadian Hydrographic Service	--					
3	Conner's Is., N. Y.	U. S. Lake Survey	--					
4	Niagara Falls, N. Y.	U. S. Lake Survey	--					
5	Niagara Falls, N. Y.	Naval Air Station	1943-53	X	X	X	X	p 15, 1
6	Niagara Falls, Ontario	CMD II	**			X	X	
7	Niagara Falls, Ontario	CMD II	**			X	X	
8	Lewiston, N. Y.	USWB cooperative	variable see data			42	37	

** See Appendix II, p. 160.

No.	Intake location (ft)	Hydrographic Data								Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
1	shoreline (27)	X		X	X	X	X			SO_4, Cl; water level from 1933	
2										water level (cont.)	
3										water level (cont.)	
4										water level (cont.)	
5											
6											
7											
8											

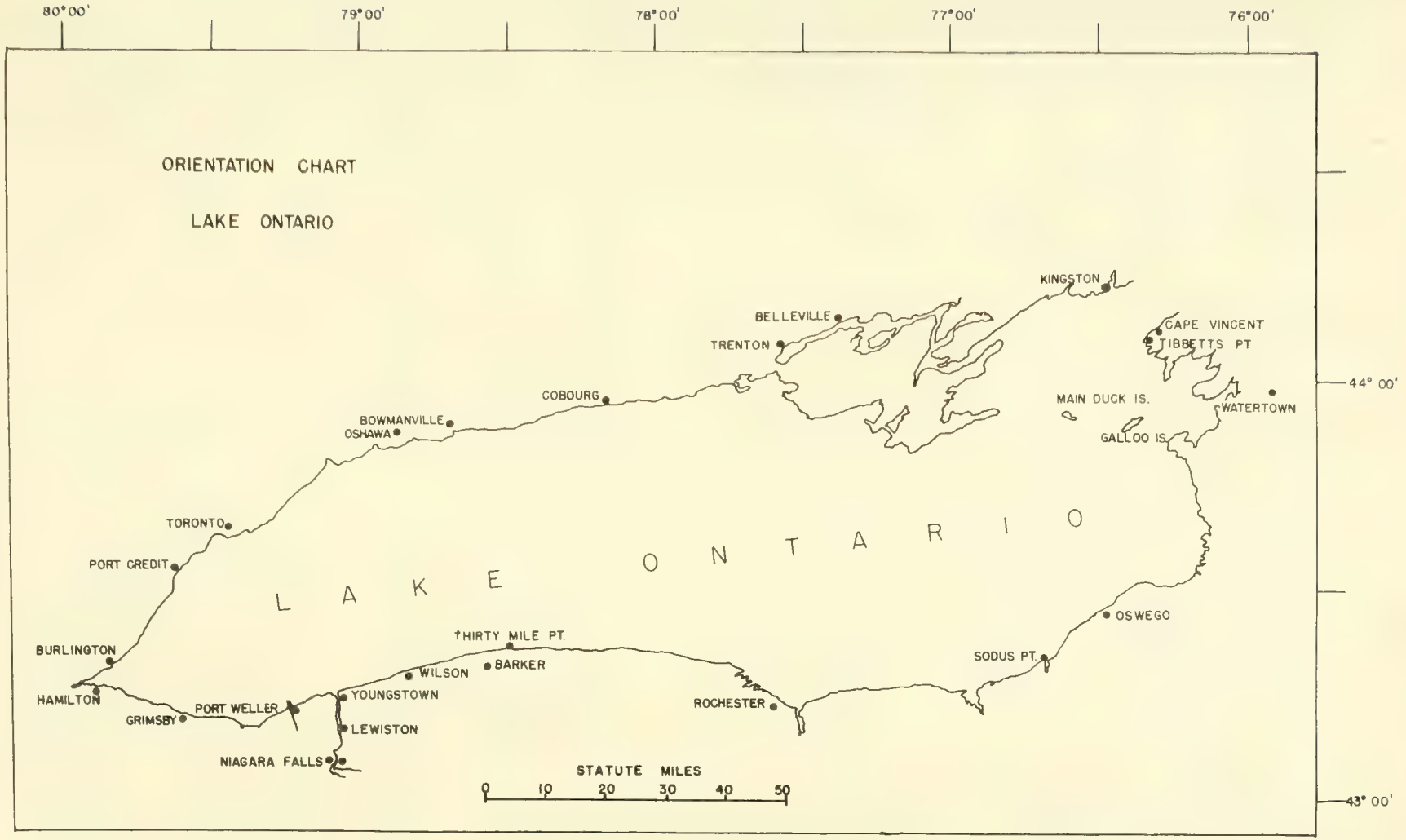

Figure 6. Orientation Chart, Lake Ontario

LAKE ONTARIO (starting at mouth of Niagara River and proceeding counterclockwise)

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
1	Niagara (Youngstown), N. Y.	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
2	Niagara, N. Y.	U. S. Lake Survey	--					
3	Wilson, N. Y.	USWB cooperative	18				X	
4	Barker, N. Y.	USWB cooperative	18				X	
5	Thirty Mile Point (Barker), N. Y.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
6	Rochester, N. Y.	Bureau of Water I. Q. Lacy, Supt.	mid 1955-					
7	Rochester, N. Y.	Eastman Kodak Co. L. C. Faulkenberry, Asst. to the Gen. Mgr.	variable see data					
8	Rochester, N. Y.	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2a
9	Rochester, N. Y.	U. S. Lake Survey	--					
10	Sodus Point, N. Y.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
11	Oswego, N. Y.	Niagara Mohawk Power Co. W. M. Jeram, Supt.	variable see data			1948-		pressure, 1948-
12	Oswego, N. Y.	USCG Lifeboat (6 hrly)	--	X	X	X		p 15, 2b

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
1											
2										lake level (tri-daily)	
3											
4											
5											
6	8300 (50)	X		X	X	X					
7	7800 (55)	1937-			1947-	1952-	1947-			radioactivity, 1952- FOLLOWING CHEM ANAL: volatile and org. matter, silica, iron and alumina oxides, CaO, MgO, sulphuric anhydride, Cl, 1947-.	
8											
9										lake level (cont.)	
10											
11	550 (20)	1948-			1940-		1940-			CO_3, HCO_3, Cl, SO_4, SiO_2, total diss. solids, conductivity, 1940-. Lake level, 1955-.	
12											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
13	Oswego, N. Y.	USWB cooperative	variable see data			104	112	
14	Oswego, N. Y.	U. S. Lake Survey	--					
15	Galloo Is., (Sacketts Hbr.), N. Y.	USCG Lifeboat (4 hrly)	--	X	X	X		p 15, 2b
16	Watertown, N. Y.	USWB Second Order CAA Ap	10	X	X	X	X	p 15, 1
17	Tibbetts Point (Cape Vincent), N. Y.	USCG Light (4 hrly)	--	X	X	X		p 15, 2b
18	Cape Vincent, N. Y.	USCG Light Attendant (4 hrly)	--	X	X	X		p 15, 2b
19	Cape Vincent, N. Y.	U. S. Lake Survey	--					
20	Kingston, Ontario	CMD c	variable see data	20	20	72	72	sunshine, 76
21	Kingston, Ontario	CMD II	**			X	X	
22	Kingston, Ontario	CMD II	**			X	X	
23	Kingston, Ontario	Canadian Hydrographic Service	--					
24	Main Duck Is., Ontario	CMD c	10	10	10			(weather)

** See Appendix II, p. 160.

No.	Intake location (ft)	Hydrographic Data								Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
13											
14										lake level (cont.)	
15											
16											
17											
18											
19										lake level (cont.)	
20											
21											
22											
23										lake level (cont.)	
24											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
25	Belleville, Ontario	CMD II	variable see data			29	29	sunshine, 25
26	Belleville, Ontario	CMD II	68			68	68	
27	Trenton, Ontario	CMD I	**	X	X	X	X	p 15, 1
28	Trenton, Ontario	CMD II	**			X	X	
29	Cobourg, Ontario	CMD II	variable see data	24	24	12	12	
30	Cobourg, Ontario	Canadian Hydrographic Service	--					
31	Bowmanville, Ontario	CMD II	**			X	X	
32	Oshawa, Ontario	CMD II	**			X	X	
33	Toronto, Ontario	Water treatment plant D. P. Scott, Deputy Comm. of Works	variable see data	ca 1948-				
34	Toronto, Ontario	Hydro-Elec. Power Comm. of Ontario, R. L. Hearn Generating Station, E. D. Holdup, Plant Supt.	variable see data					
35	Toronto, Ontario	West Hill CMD III	**				X	
36	Toronto, Ontario	Scarborough CMD III	**				X	

** See Appendix II, p. 160.

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
25											
26											
27											
28											
29											
30										lake level (cont.)	
31											
32											
33	before 1918: 3800 (35 1918-pres: 3800 (69)	1936-		1912-	1925-	1913-	1912-17 1922-23 1931	1912-	1914-	plankton, 1922- nitrogen, Cl, diss. O_2 (period uncertain) lake level, 1912-	
34	see remarks	1952-		1955-	1955-		1955-			conductivity, 1955-	
35											
36											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
37	Toronto, Ontario	Birchcliffe CMD III	**				X	
38	Toronto, Ontario	Admiral Road CMD III	**				X	
39	Toronto, Ontario	Balmy Beach CMD III	**				X	
40	Toronto, Ontario	Hyde Park CMD III	**				X	
41	Toronto, Ontario	Highland CMD II	**			X	X	
42	Toronto, Ontario	Newtonbrook CMD II	**			X	X	
43	Toronto, Ontario	CMD I	variable see data	36	36	119	119	sunshine, 77 p 15, 1
44	Toronto, Ontario	Canadian Hydrographic Service	--					
45	Port Credit, Ontario	CMD II	**			X	X	
46	Burlington, Ontario	CMD II	**			X	X	
47	Hamilton, Ontario	Water treatment plant D. H. Matheson, Dir. of Laboratories	variable see data	1957-	1957-	1951-	(X) (gauges op. by City Engrs. Dept.)	
48	Hamilton, Ontario	CMD III (Gage Park)	**				X	
49	Hamilton, Ontario	CMD II (Hamilton)	**			(X)	58	

** See Appendix II, p. 160.

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
37											
38											
39											
40											
41											
42											
43											
44										lake level (cont.)	
45											
46											
47	TWO IN-TAKES 2200 (30) 3000 (30)	1934-		1933-	1933-	1934-	1933-	1933-	1934-	chem, phys, biol. work on Burlington Bay at intervals since 1935 lake level, 1952-	
48											
49											

No.	Location	Agency and Contact	Period of Record	Meteorological Data				
				Wind Dir.	Wind Speed	Air Temp.	Pcpn.	Other
50	Hamilton, Ontario	CMD I	**	X	X	X	X	p 15, 1
51	Grimsby, Ontario	CMD II	**			X	X	
52	Grimsby, Ontario	CMD II	**			X	X	
53	Port Weller, Ontario	Canadian Hydrographic Service	--					

** See Appendix II, p. 160.

No.	Intake location (ft)	Hydrographic Data									Remarks
		Water temp.		Alk.	pH	Turb.	Hard.	Bacteria		Other	
		Raw	Treated					Coli.	Total		
50											
51											
52											
53										lake level (cont.)	

H. Non-tabulated Data

Information relating to river discharge has not been included in the tabulations. Discharge figures for major streams and rivers tributary to the Great Lakes are obtained from gaugings in both the United States and Canada. In the United States, the responsible agency is the U. S. Geological Survey. Records pertinent to the Great Lakes basin are published yearly in the publication Surface Water Supply of the St. Lawrence River Basin.

In Canada, discharge records are obtained by the Canada Department of Northern Affairs and National Resources, Water Resources Branch. Records are published yearly in Water Resources Papers, which are very similar to those issued by the U. S. Geological Survey.

Both of the above publications are generally two to three years in arrears. More recent data, if desired, are available from individual U. S. Geological Survey offices in the United States, or from the Department of Northern Affairs and National Resources, Water Resources Branch, Ottawa, Ontario.

There are several sources of meteorological data that are not shown in Table 1. Principally, these are data collected by commercial vessels operating on the Lakes. These have not been listed in Table 1 since the data are obtained in varying quantities and locations during the year.

There are approximately 37 commercial lake vessels operated by United States companies and about half that many Canadian commercial vessels that make meteorological measurements when operating more than four miles from shore. These data are transmitted by radio to collection agencies in Canada and the United States for use by marine meteorological personnel and for dissemination over meteorological communications networks.

In addition, there is a smaller number of research and other special purpose vessels which take meteorological data at whatever time they may be conducting operations. This group is comprised of fisheries investigations vessels, U. S. Lake Survey vessels such as the "Williams", the paper mill cruiser operated in northeastern Lake Superior by Colin A. MacMillan of the Marathon Paper Company, and the U. S. Coast Guard cutter "Mackinac." The latter vessel makes six-hourly reports to the U. S. Weather Bureau at Cleveland, Ohio, whenever operating farther than four miles from shore.

Table 2. Inland Data Sources

Table 2 lists all meteorological data sources that were inland from the sources listed in Table 1. An inland source was defined to be suitable for inclusion in Table 2 if it was more than two miles from the nearest Lake shoreline. As was indicated earlier, an irregular area surrounding the Lakes was specified to be important as far as the meteorological effects on the Lakes are concerned. This "area of influence" was selected as the drainage basin of the Great Lakes. The basin has been determined by the U. S. Lakes Survey (see Fig. 7, p. 112).

All data sources in the drainage basin (or watershed) of the Lakes, that could be ascertained by the project, are listed. Tabulations are made geographically by state and province, but alphabetically by stations under each province and state. Accordingly, the geographical coordinates of inland stations are shown in degrees and minutes of arc. The type of data source is indicated in the second column; abbreviations have the following meanings: FO - USWB First Order; SO - USWB Second Order; Co - USWB Cooperative; I - CMD Class I; II, III, and c - CMD Classes II, III, and c, respectively; and R - research facility. Some locations have more than one First Order station. Usually one is located at an airport; hence the abbreviation Ap is used in the tabulations. If the installation is in the city, City is used, and if the facility is military, the following are used: NAS for Naval Air Stations, and AFB for Air Force Bases. The letters CAA and USCG refer to Civil Aeronautics Administration and U. S. Coast Guard facilities, respectively.

With respect to future use of the material compiled in Tables 1 and 2, project personnel adjudged that data sources in close juxtaposition to the watershed boundary, but outside it, should be included in the tabulation. This procedure was justified on the grounds that meteorological events (precipitation, for example), although occurring outside the basin would, nevertheless, be representative of conditions in the immediate vicinity of the basin boundary. The number and locations of extra-basin stations were arbitrarily selected. Here again, the stations outside the watershed used by the U. S. Lake Survey in computation of precipitation regimes for lake level studies were used as a basic group. In addition to these, several First Order and Class I stations were included even though they were located somewhat farther distant than most from the basin boundary. All stations outside the boundary are indicated in Table 2 by an asterisk preceding the location name.

The same system for indicating length of record and parameters measured is used here that was employed in Table 1; that is, the numbers appearing in the columns to the right of the location specifications are years of record. Where it is known that an element is measured but the length of record is not known, "X" appears in the space. All parameters taken that are not specified in the table may be determined by consulting the reference given in the last column to the right.

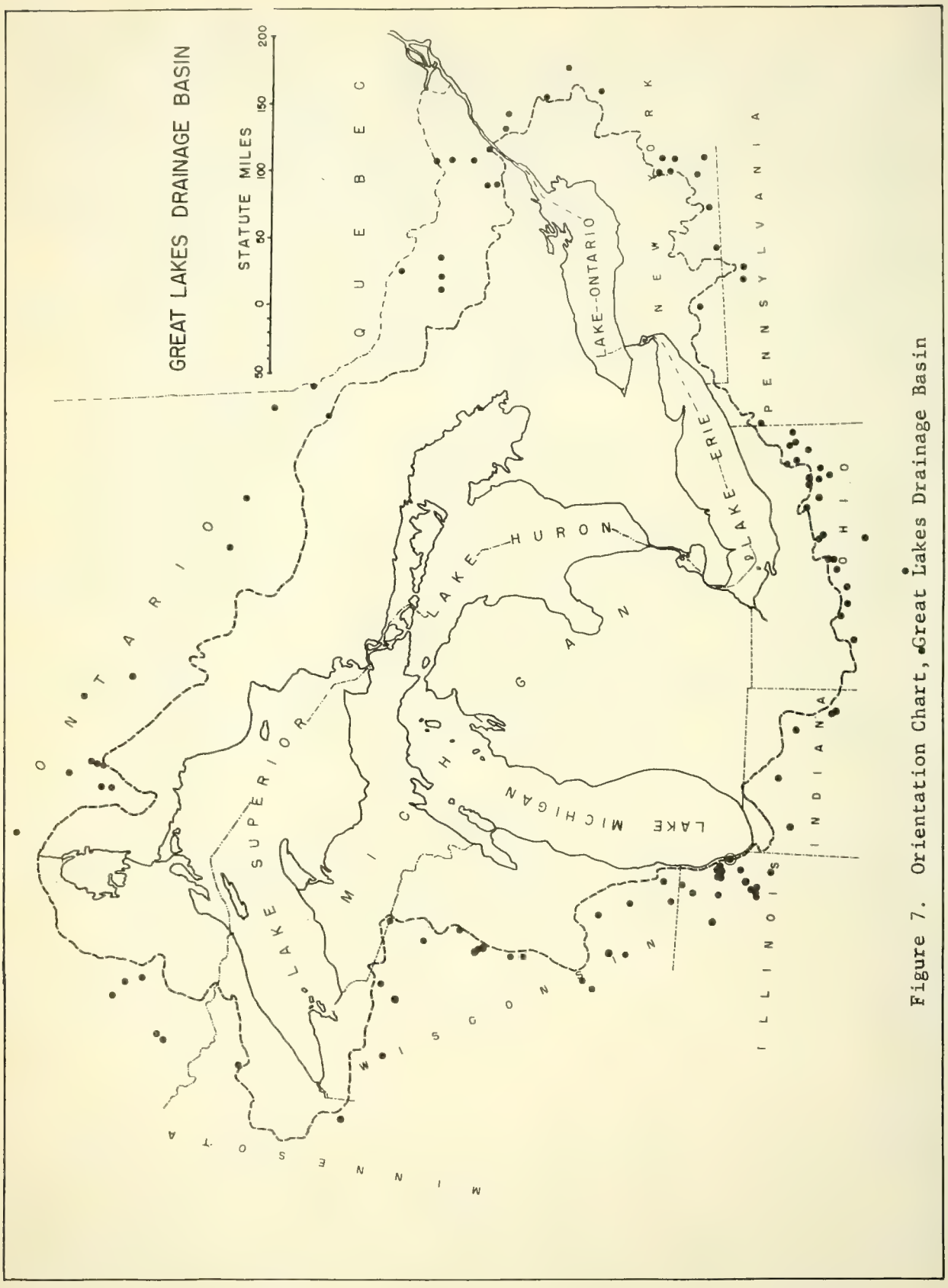

Figure 7. Orientation Chart, Great Lakes Drainage Basin

Table 2. Inland Data Sources

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		MINNESOTA										
1	Co	*Babbitt	47	41	91	55	39	38	39			
2	Co	Brimson	47	16	91	52	--		X			
3	Co	Cloquet Exp. For.	48	42	94	18	48	48	48			
4	FO	Duluth Airport	46	50	92	11	18	18	18	18	18	p 15, 1:(18)
5	Co	Gunflint Lake	48	05	90	42	8		8			
6	Co	Hibbing Power Substation	47	27	92	57	--		X			
7	Co	Holyoke	46	28	92	23	16		16			
8	Co	Isabella 1 mi. W	47	37	91	22	1	1	1			
9	Co	Island Lake Reservoir	46	59	92	14	--		X			
10	Co	Mahoning Mine	47	28	92	59	38	37	38			
11	Co	Meadowlands 2 mi. SSW	47	03	92	45	49	48	49			
12	Co	*Moose Lake 1 mi. SE	46	27	92	45	37	35	37			
13	Co	*Moose Lake Ranger Station	46	27	92	46	30		30			
14	Co	Virginia OMIC Lab.	47	32	92	32	65	65	65			
15	Co	Wales 2 mi. E	47	13	91	43	15		15			
16	Co	Whiteface Reservoir	47	17	92	11	--		X			
		WISCONSIN										
1	Co	*Antigo	45	09	89	09	65	65	65			
2	Co	Appleton	44	15	88	23	55	55	55			
3	Co	Berlin	43	58	88	57	18		18			
4	Co	Bowler	44	52	88	59	21		21			
5	Co	Breakwater	45	50	88	15	37		37			
6	Co	Brillion	44	11	88	04	35		35			
7	Co	Brule Ranger Sta.	46	32	91	35	28		28			
8	Co	Brule Island	45	57	88	13	37	23	37			
9	Co	*Burnett	43	30	88	42	56	56	56			
10	Co	Chilton Sewage Plant	44	02	88	09	32	32	32			
11	Co	Clintonville	44	37	88	45	18	6	18			
12	Co	*Coddington 1 mi. E	44	22	89	32	38	38	38			
13	Co	Crivitz High Falls	45	17	88	12	48	48	48			
14	Co	Dalton	43	39	89	12	14	14	14			
15	Co	Drummond	46	20	91	15	16		16			
16	Co	Eldurado 1 mi. SE	43	48	88	37	20	20	20			
17	Co	*Flambeau Reservoir	46	04	90	14	33		33			
18	Co	Fond du Lac	43	47	88	27	73	73	73			

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		WISCONSIN cont.										
19	Co	Germantown 2 mi. W	43	13	88	09	15	15	15			
20	FO	Green Bay Airport	44	29	88	08	72	72	72	72	72	p 15, 1:(72)
21	Co	Gurney	46	28	90	30	6	6	6			
22	Co	Hancock Exp. Farm	44	07	89	32	67	67	67			
23	Co	*Hayward Ranger Station	46	00	91	29	27		27			
24	Co	Lac Vieux Desert	46	08	89	08	14		14			
25	Co	*Lake Geneva	42	36	88	26	14	14	14			
26	Co	Laona 4 mi. SSW	45	30	88	42	29	28	29			
27	Co	Lily	45	19	88	51	17		17			
28	Co	Longlake Dam	45	54	89	08	51	51	51			
29	FO	*Madison Airport	43	08	89	20	19	19	19	19	19	p 15, 1:(19)
30	FO	*Madison City	43	05	89	24	90	90	90	90	90	p 15, 1:(90)
31	FO	*Madison Truax AFB	43	18	89	21	--	X	X	X	X	p 15, 1:(X)
32	Co	Mellen 2 mi. N	46	21	90	37	33	33	33			
33	Co	Mercer Ranger Sta.	46	10	90	04	25		25			
34	FO	Milwaukee Ap.	42	57	87	54	31	31	31	31	31	p 15, 1:(31)
35	Co	Montello	43	48	89	19	63	51	63			
36	Co	New London	44	23	88	44	63	63	63			
37	Co	*Oconomowoc 1 mi. SW	43	06	88	31	20	20	20			
38	Co	Oshkosh	44	03	88	32	70	70	70			
39	SO	*Park Falls	45	56	90	27	48	48	48	X	X	p 15, 1:(X)
40	Co	Peshtigo	45	04	87	44	13		13			
41	Co	*Phelps Deerskin Dam	46	03	89	02	49		49			
42	Co	Pine River 3 mi. NE	44	11	89	02	7	7	7			
43	Co	Plymouth	43	45	87	59	49	49	49			
44	Co	Portage	43	32	89	27	70	66	70			
45	Co	Rest Lake	46	08	89	53	49	49	49			
46	Co	*Rhinelander	45	38	89	25	57	54	57			
47	Co	Ripon 5 mi. NE	43	52	88	45	--		X			
48	Co	Rosholt Collins	44	36	89	20	18	X	18			
49	Co	Shawano	44	47	88	37	63	63	63			
50	Co	Solon Springs	46	21	91	49	53	53	53			
51	Co	South Pelican	45	32	89	12	14		14			
52	Co	*Stevens Point	44	30	89	34	66	66	66			
53	Co	Summit Lake Ranger Station	45	23	89	12	19		19			
54	Co	Townsend	45	20	88	35	14	14	14			
55	Co	*Union Grove	42	42	88	03	18		18			
56	Co	Waupaca	44	22	89	05	64	63	64			
57	Co	*Wausau	44	59	89	39	14		14			
58	SO	*Wausau CAA Ap.	44	55	89	37	64	64	64	X	X	p 15, 1:(X)
59	Co	*Wausau Old P.O.	44	57	89	38	25	25	25			
60	Co	Wausaukee	45	23	87	57	26		26			
61	Co	West Allis	43	01	87	59	7	7	7			
62	Co	West Bend	43	25	88	11	45	45	45			
63	Co	*Wisconsin Dells	43	38	89	47	36	36	36			

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:rys)
		ILLINOIS										
1	Co	*Antioch	42	29	88	06	38	38	38			
2	Co	*Arlington Hgts. 4 mi. SSE	42	02	87	58	8		8			
3	Co	*Chicago Calumet Treatment Works	41	40	87	36	21		21			
4	Co	*Chgo Mayfair Pmpg. Station	41	58	87	45	32		32			
5	Co	*Chgo N. Br. Pmpg. Station	41	58	87	42	25		25			
6	Co	*Chgo Roseland Pmpg. Station	41	42	87	38	32		32			
7	Co	*Chgo San. Dist. Disp. Plant	41	50	87	42	27		27			
8	Co	*Chgo Springfield Pmpg. Station	41	55	87	44	32		32			
9	FO	*Chicago Midway Airport	41	47	87	45	30	30	30	30	30	p 15, 1:(30)
10	FO	*Chicago O'Hare Airport	42	00	87	53	--	X	X	X	X	p 15, 1:(X)
11	Co	*Elgin	42	02	88	17	51		51			
12	FO	*Glenview NAS	42	05	87	49	15	15	15	15	15	p 15, 1:(X)
13	Co	*Joliet Brandon Rd.	41	30	88	06	67		67			
14	SO	*Joliet CAA Ap.	41	36	88	05	--	X	X	X	X	p 15, 1:(X)
15	Co	*Joliet	41	32	88	05	17	16	17			
16	R	*Lemont Argonne National Lab.	41	40	88	00	10	10	10	10	10	radiation, micrometeorological measurements (10)
17	Co	*McHenry	42	21	88	16	19		19			
18	Co	*McHenry 2 mi. S	42	19	88	15	17		17			
19	Co	*Peotone	41	20	87	48	18		18			
20	Co	*Wheaton College	41	52	88	06	30	X	30			
21	Co	*Skokie	42	02	87	45	4	4	4			
22	Co	*Skokie N. Side Treatment Works	42	01	87	43	--		X			
		INDIANA										
1	Co	Angola	41	38	85	00	60	60	60			
2	Co	Berne	40	40	84	57	48	48	48			
3	Co	*Bluffton	40	44	85	11	62		62			
4	Co	*Bluffton Sewage Plant	40	45	85	11	18		18			
5	Co	*Bluffton Water Works	40	44	85	10	10	X	10			
6	Co	*Columbia City	41	09	85	29	56	21	56			
7	Co	*Columbia City 1 mi. S	41	08	85	29	18		18			

No.	Class	Location	Lat N deg	min	Long W deg	min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		INDIANA cont.										
8	Co	Decatur	40	51	84	56	27		27			
9	Co	Elkhart	41	41	85	58	8		8			
10	Co	Ft. Wayne Disposal Plant	41	06	85	07	13		13			
11	FO	Ft. Wayne Airport	41	00	85	12	47	47	47	47	47	p 15, 1:(47)
12	Co	Fremont	41	44	84	56	9		9			
13	SO	Goshen CAA Airport	41	32	85	48	18	X	18	X	X	p 15, 1:(X)
14	Co	Goshen College	41	34	85	50	44	44	44			
15	Co	Hobart	41	32	87	15	39	39	39			
16	Co	Kendallville	41	27	85	15	12	12	12			
17	Co	Kendallville	41	26	85	16	18		18			
18	Co	Lagrange	41	39	85	25	18		18			
19	Co	La Porte	41	36	86	43	64	61	64			
20	Co	Monroeville 3 mi. ENE	40	59	84	49	18		18			
21	Co	*Plymouth Power Substation	41	20	86	20	54	53	54			
22	FO	South Bend Airport	41	42	86	19	71	65	71	65	65	p 15, 1:(65)
23	Co	Valparaiso Water Works	41	31	87	02	59	58	59	X		evaporation (X)
24	Co	Waterloo	41	25	85	02	21	19	21			
25	Co	Waterloo Highway Garage	41	26	85	01	18		18			
26	Co	*Wheatfield	41	11	87	04	41	41	41			
		MICHIGAN										
1	Co	Adrian	41	54	84	02	81	81	81			
2	Co	Alberta Ford Forestry Court	46	39	88	29	1	1	1			
3	Co	Albion Rice Creek Station	42	17	84	46	49		49			
4	Co	Allegan Sewage Pl.	42	32	85	51	70	70	70			
5	Co	Alma	43	23	84	40	72	72	72			
6	Co	Ann Arbor Univ. Sta.	42	17	83	44	79	79	79	1		suns., press. (2)
7	Co	Atlanta 3 mi. ENE	45	01	84	06	32	32	32			
8	Co	Bad Axe	43	48	83	01	34	34	34			
9	Co	Baldwin St. Forest	43	54	85	51	31	31	31			
10	SO	Battle Creek Ap.	42	18	85	14	75	75	75	X	X	p 15, 1:(X)
11	Co	Beavertown Pwr. Pl.	43	53	84	29	11		11			
12	Co	Beechwood 7 mi. WNW	46	11	88	53	--	X	X			
13	Co	Bellaire Hydro. Plant	44	59	85	12	13		13			
14	Co	Bergland Hydro. Plant	46	35	89	33	35	26	35			
15	Co	Big Rapids Water Works	43	42	85	29	63	63	63			
16	Co	Bloomingdale	42	23	85	57	--	X	X			

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		MICHIGAN cont.										
17	Co	Boyne Falls St. Nursery	45	13	84	48	--	X	X			
18	Co	Burnside 1 mi. E	43	12	83	03	16		16			
19	Co	Cadillac Water Works	44	15	85	24	50	50	50			
20	Co	Caro State Hosp.	43	27	83	24	31	31	31			
21	Co	Casnovia 1 mi. N	43	15	85	48	16		16			
22	Co	Champion Van Riper Park	46	31	87	59	--	X	X			
23	Co	Charlotte	42	32	84	50	55	55	55			
24	Co	Chatham Exp. Farm	46	21	86	56	58	55	58			
25	Co	Coldwater St. Sch.	41	57	85	00	68	68	68			
26	Co	Coldwater Sewage Treatment Plant	41	56	85	01	--		X			
27	Co	Crystal Falls 6 mi. NE	46	10	88	14	16		16			
28	Co	Dearborn	42	18	83	14	6	6	6	6		evaporation (6)
29	FO	Detroit City Ap.	42	24	83	00	88	88	88	88	88	p 15, 1:(88)
30	FO	Detroit Wayne Co. Airport	42	13	83	19	5				5	ceiling, visibility(5)
31	FO	Detroit Willow Run Airport	42	14	83	32	8	8	8	8	8	p 15, 1:(8)
32	R	Detroit Int'l Joint Comm. Res.	42	28	83	14	3	3				lapse rate to 870 ft (3)
33	Co	Dowagiac	41	59	86	07	5	5	5			
34	Co	East Jordan	45	10	85	07	33	33	33	33	33	
35	Co	East Lansing Exp. Farm	42	42	84	28	--	X	X	X		evaporation (X)
36	FO	East Lansing	42	44	84	29	48	48	48	48	48	p 15, 1:(48)
37	Co	East Lansing Hort. Farm	42	43	84	28	1	1	1	1		evaporation (1)
38	Co	Eaton Rapids	42	31	84	39	39		39			
39	Co	Eau Claire 4 mi. NE	42	01	86	15	35	35	35			
40	Co	Edmore	43	24	85	02	5		5			
41	Co	Evart	43	54	85	16	7	7	7			
42	Co	Ewen	46	32	89	16	16		16			
43	Co	Fife Lake 2 mi. S	44	33	85	21	40	40	40			
44	FO	Flint Airport	42	58	83	44	70	70	70	21	21	p 15, 1:(21)
45	Co	Freesoil 4 mi. SW	44	04	86	17	16		16			
46	Co	Gaylord Cons. Dpt.	45	02	84	41	49	39	49			
47	Co	Germfask Wildlife Refuge	46	17	85	57	19	19	19	X		evaporation (X)
48	SO	Gladwin CAA Ap.	43	59	84	29	54	54	54	X	X	p 15, 1:(X)
49	Co	Glennie Alcona Dam	44	56	85	55	11		11			
50	Co	Grand Haven Fire Dept.	44	34	83	48	88	88	88			
51	Co	Grand Ledge	42	45	84	46	41		41			

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp yrs	Pcpn yrs	Wind yrs	Wea Yrs	Other (ref: yrs)
		MICHIGAN cont.										
52	FO	Grand Rapids Ap.	42	54	85	40	109	109	104	109	109	p 15, 1:(98)
53	Co	Grayling Military Reservation	44	38	84	47	69	69	69			
54	Co	Greenville	43	11	85	15	46	46	46			
55	Co	Gull Lake Exp. Farm	42	24	85	23	30	30	30			
56	Co	Gwinn	46	17	87	27	--		X			
57	Co	Hale Five Channels Dam	44	28	83	41	46	46	46			
58	Co	Harrison	44	01	84	48	52		52			
59	Co	Hart	43	42	86	22	69	69	69			
60	Co	Hastings Fisher.	42	39	85	18	66	66	66			
61	Co	Hesperia	43	34	86	02	22	13	22			
62	Co	Higgins Lake	44	31	84	45	58	58	58			
63	Co	Hillsdale	41	55	84	38	71	62	71			
64	Co	Holland	42	47	86	07	54	54	54			
65	SO	Houghton CAA Ap.	47	10	88	30	6	6	6	X	X	p 15, 1:(X)
66	R	Houghton Univ. of Michigan res.	47	14	88	29	1	1	1	1		snow depth (1); radiation, humd. and press. (1)
67	R	Houghton U.S. Army Sig. Corps	47	12	88	30	5	5	5	5	5	min. and max. temp., hum., (5)
68	Co	Houghton Lake 3 mi. NW	44	20	84	49	44	44	44			
69	Co	Howell Sewage Pl.	42	36	83	56	53		53			
70	Co	Howell 7 mi. NE	42	42	83	53	9		9			
71	Co	Hubbard Lake Dam	44	51	83	36	--		X			
72	Co	Interlochen State Park	44	38	85	46	16		16			
73	Co	Ionia Gas Plant	42	59	85	04	28	28	28			
74	Co	Iron Mtn. Water Works	45	50	88	04	59	59	59			
75	Co	Ironwood	46	27	90	10	57	57	57			
76	Co	Ishpeming	46	29	87	39	60	60	60			
77	SO	Jackson CAA Ap.	42	16	84	28	62	62	62	X	X	p 15, 1:(X)
78	Co	Jackson 3 mi. N	42	17	84	24	18		18			
79	Co	Kalamazoo Power Plant	42	18	85	34	18		18			
80	Co	Kalamazoo State Hospital	42	17	85	36	83	83	83			
81	Co	Kalkaska	44	44	85	10	19		19			
82	Co	Kent City 2 mi. SW	43	12	85	46	39		39			
83	Co	Kenton U.S. For.	46	29	88	53	18	18	18			
84	FO	Kinross AFB	46	15	84	28	5	5	5	X	X	p 15, 1:(X)
85	Co	Lapeer	43	03	83	20	--	X	15			
86	Co	Lowell 5 mi. NW	42	59	85	25	44		44			

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		MICHIGAN cont.										
87	Co	Lupton	44	26	84	02	8		8			
88	Co	Lupton 1 mi. SW	44	25	84	02	7	7	7	7		evaporation (7)
89	Co	Millington 3 mi. SW	43	14	83	34	57		57			
90	Co	Mio Hydro. Plant	44	40	84	08	55	55	55			
91	Co	Montague	43	25	86	22	8	8	8			
92	Co	Montague 2 mi. N	43	27	86	21	16		16			
93	Co	Mt. Pleasant Col.	43	36	84	47	58	58	58			
94	Co	Newaygo Croton Dam	43	27	85	40	51	51	51			
95	Co	Newberry State Hospital	46	20	85	30	60	60	60			
96	Co	Niles	41	51	86	16	2		2			
97	FO	Oscoda AFB	44	28	83	22	--	X	X	X	X	p 15, 1:(X)
98	Co	Onaway Black L. Forest	45	25	84	14	15		15			
99	Co	Owosso Swg. Plant	43	01	84	11	63	63	63			
100	Co	Paw Paw 2 mi. E	42	13	85	51	38	38	38			
101	SO	Pelston CAA Ap.	45	34	84	48	17	17	17	X	X	p 15, 1:(X)
102	Co	Pontiac	42	39	83	18	71	71	66			
103	Co	Rexton	46	10	85	15	6	6	6			
104	Co	Rock	46	04	87	10	18		18			
105	Co	Romeo 1 mi. N	42	49	83	01	24		24			
106	Co	Roscommon Forest Exp. Station	44	28	84	35	--		X			
107	Co	Rose City	44	26	84	07	8		8			
108	Co	Saginaw Center Radio Station	43	29	84	02	3	3	3			
109	SO	Saginaw-Midland-Bay City CAA Ap.	43	32	84	05	62	62	62	X	X	p 15, 1:(X)
110	Co	St. Charles	43	18	84	08	17	6	17			
111	Co	St. Johns 5 mi. NNW	43	04	84	35	38	38	35			
112	Co	Sandusky	43	25	82	50	40	40	40			
113	Co	Scottville 1 mi. NE	43	58	86	16	34		34			
114	Co	Sebewaing 3 mi. E	43	44	83	23	17		17			
115	Co	Spalding	43	43	83	27	5		5			
116	Co	Stambaugh	46	05	88	38	63	63	63			
117	Co	Standish 2 mi. S	43	57	83	58	25	25	25			
118	Co	Stanton	43	17	85	04	3		3			
119	Co	Stephenson 5 mi. W	45	24	87	43	--	X	19			
120	Co	Steuben 2 mi. WNW	46	12	86	30	19		19			
121	Co	Suttons Bay 4 mi. NW	45	01	85	42	19		19			
122	Co	Thompsonville	44	31	85	56	19		19			
123	Co	Three Rivers	41	56	85	38	62	62	62			

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		MICHIGAN cont.										
124	Co	Trout Lake 2 mi. ESE	46	11	84	59	--		X			
125	Co	Vanderbilt Trout Station	45	10	84	27	46	46	46			
126	Co	Wakefield	45	29	89	55	16		16			
127	Co	Watersmeet Fish Hatchery	46	18	89	05	20	20	20			
128	Co	Wellston Tippey Dam	44	15	85	57	38		38			
129	Co	West Branch State Forest	44	20	84	17	56		56			
130	Co	Williamston 1 mi. NE	42	41	84	16	22		22			
131	Co	Willis 1 mi. NE	42	05	83	35	29	29	29			
132	Co	Yale	43	08	82	48	32		32			
		OHIO										
1	FO	*Akron-Canton Ap.	40	55	81	26	11	11	11	11	11	p 15, 1:(11)
2	FO	*Akron Municipal Airport	41	02	81	27	30	30	30	25	25	p 15, 1:(25)
3	Co	*Akron Swg. Wks.	41	09	81	34	1		1			
4	Co	*APCO Ravenna Arsenal	41	10	81	05	11	11	11			
5	Co	*Ashland 2 mi.ENE	40	54	82	18	49		49			
6	Co	*Ashland 3 mi. NW	40	53	82	22	58	56	58			
7	Co	Ashtabula	41	51	80	48	8	8	8			
8	Co	Botzum Swg. Plant	41	09	81	34	18		18			
9	Co	Bowling Green Sewage Plant	41	23	83	38	77	64	77			
10	Co	Bucyrus Swg. Pl.	40	48	82	58	65	63	65			
11	Co	Burton	41	29	81	09	9		9			
12	Co	*Canton Repository	40	48	81	23	6	6	6			
13	Co	*Canton Hwy. Dpt.	40	48	81	22	19		19			
14	Co	Chardon	41	35	81	12	13	13	13			
15	Co	*Charles Mill Dam	40	44	82	22	18	18	18	X		evaporation (X)
16	Co	*Chippewa Lake	41	05	81	54	63	63	63			
17	FO	Cleveland Airport	41	24	81	51	32	32	32	32	32	p 15, 1:(32)
18	FO	Cleveland City	41	30	81	42	88	88	88	88	88	p 15, 1:(88)
19	Co	*Columbus Ohio State Univ.	40	00	83	01	74	74	74	X		evaporation (X)
20	Co	*Columbus Sullivant Ave.	39	56	83	05	8	8	8			
21	Co	*Columbus Valley Cross	39	56	82	57	42	42	42			
22	FO	*Columbus Airport	40	00	82	53	28	28	28	28	28	p 15, 1:(28)

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		OHIO cont.										
23	FO	*Columbus City	39	58	83	00	79	79	79	79	79	p 15, 1:(79)
24	Co	*Dayton	39	45	84	10	23	23	23	X		evaporation (X)
25	FO	*Dayton Airport	39	54	84	12	28	28	28	28	28	p 15, 1:(28)
26	Co	Defiance	41	17	84	23	54	48	54			
27	Co	Defiance Pwr. Pl.	41	17	84	28	17		17			
28	Co	Dorset 2 mi. E	41	41	80	38	2	2	2			
29	Co	Edgerton	41	27	84	44	17		17			
30	Co	*Ellsworth	41	01	80	51	43		43			
31	Co	Elyria 3 mi. E	41	23	82	04	10	10	10			
32	SO	Findlay CAA Ap.	41	01	83	40	17	X	17	X	X	p 15, 1:(X)
33	Co	Findlay Swg. Pl.	41	03	83	40	69	69	69			
34	Co	Fremont	41	20	83	07	18	6	18			
35	Co	*Galion Wtr. Wks.	40	43	82	47	12		12			
36	Co	*Hiram	41	19	81	09	78	74	78			
37	Co	Hoytville 2 mi. NE	41	12	83	47	7	7	7			
38	Co	Kenton Ohio Pwr. Co.	40	38	83	37	17		17			
39	Co	*Kenton 2 mi. W	40	39	83	39	66	65	66			
40	Co	*Lakeview 3 mi. NE	40	32	83	54	42		42			
41	Co	*La Rue	40	34	83	23	40		40			
42	Co	Lima Swg. Plant	40	43	84	07	59	56	59			
43	Co	Lima Water Works	40	45	84	05	17		17			
44	R	Lima Standard Oil Co.	40	44	84	08	--	X	X	X		
45	Co	*Louisville	40	50	81	16	12		12			
46	Co	Lyons High School	41	42	84	04	18		18			
47	Co	*Mansfield 6 mi. W	40	45	82	38	59	39	59			
48	SO	Mansfield CAA Ap.	40	47	82	32	--	X	X	X	X	p 15, 1:(X)
49	Co	*Marion Wtr. Wks.	40	36	83	10	15	X	15			
50	Co	*Marshallville	40	54	81	43	10		10			
51	Co	Montpelier	41	35	84	36	67	56	67			
52	Co	Napoleon	41	23	84	07	72	64	72			
53	Co	Norwalk	41	15	82	37	74	64	74			
54	Co	Oberlin	41	17	82	13	82	74	82			
55	Co	Painesville Hwy. Department	41	43	81	13	19		19			
56	Co	Pandora 2 mi. NE	40	58	83	51	17	17	17			
57	Co	Paulding	41	08	84	35	68	63	68			
58	Co	Plymouth	41	00	82	40	25	25	25			
59	Co	Rockford 5 mi. WNW	40	42	84	45	4		4			
60	Co	Rockford 0.3 mi. W	40	38	84	48	19		19			
61	Co	St. Marys 2 mi. W	40	32	84	25	20		20			
62	Co	St. Marys Water Works	40	32	84	24	21		21			

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		OHIO cont.										
63	Co	S. New Lyme 1 mi. W	41	35	80	46	12		12			
64	Co	Tiffin	41	07	83	10	77	72	77			
65	FO	Toledo Exp. Ap.	41	36	83	48	4	4	4	4	4	p 15, 1:(4)
66	Co	Toledo Blade	41	39	83	32	7	7	7			
67	FO	Toledo City	41	40	83	34	85	85	85	85	85	p 15, 1:(85)
68	Co	Upper Sandusky	40	50	83	17	75	74	75			
69	Co	Upper Sandusky Water Works	40	49	83	17	18		18			
70	Co	Van Wert	40	52	84	35	44	43	44			
71	Co	*Warren	41	15	80	51	69	65	69			
72	Co	*Warren Ohio Edison	41	13	80	48	24		24			
73	Co	Wauseon Sewage PL	41	33	84	08	88	88	86			
74	FO	*Youngstown Ap.	41	16	80	40	87	87	16	16	16	p 15, 1:(16)
		PENNSYLVANIA										
1	Co	*Coudersport 3 mi. NW	41	49	78	03	3	3	3			
2	Co	*Coudersport 7 mi. E	41	46	77	53	12		12			
3	Co	*Linesville	41	41	80	31	41	7	41			
4	Co	North East 2 mi. SE	42	12	79	49	9		9			
5	Co	Springboro	41	48	80	23	4	4	4			
		NEW YORK										
1	Co	Albion 3 mi. NE	43	16	78	08	21	21	21			
2	Co	Alexandria Bay	44	20	75	55	27	23	27			
3	Co	Alfred	42	15	77	47	66	62	66			
4	Co	Angelica	42	18	78	02	74	74	74			
5	Co	Arcade	42	32	78	25	36	7	36			
6	Co	Arnot Lodge	42	16	76	38	4		4			
7	Co	Arnot SCS	42	14	76	37	11		11			
8	Co	Auburn Wtr. Wks.	42	54	76	32	95	95	89	X		
9	Co	Aurora Research Farm	42	44	76	39	2	2	2	2		evaporation (2)
10	Co	Avon	42	55	77	45	63		63			
11	Co	Baldwinsville	43	09	76	20	60	21	60			
12	Co	Batavia	43	00	78	11	28	28	28			
13	Co	Beaver Falls	43	53	75	26	25		25			
14	Co	Big Moose 3 mi. E	43	49	74	52	28		28			
15	FO	*Binghamton	42	13	75	59	8	8	8	8	8	p 15, 1:(8)
16	Co	*Binghamton	42	06	75	55	69	69	69			
17	Co	Black R. 1 mi. SW	44	00	75	49	19		19			

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		NEW YORK cont.										
18	Co	Boonville 2 mi. N	43	31	75	21	36		36			
19	Co	Boonville 2 mi. SSW	43	27	75	21	10	10	10	X		evaporation (X)
20	Co	Brewerton Lock 23	43	14	76	12	27		27			
21	Co	Bristol Springs	42	43	77	22	27		27			
22	Co	Brockport 2 mi. NW	43	15	77	58	9	9	9			
23	FO	Buffalo Airport	42	56	78	44	108	108	102	88	88	p 15, 1:(88)
24	Co	Burdett 1 mi. NE	42	25	76	50	27		27			
25	Co	Camden	43	20	75	44	13		13			
26	Co	Canandaigua 3 mi. S	42	51	77	17	27	25	27			
27	Co	Canaserage	42	28	77	47	5		5			
28	Co	Canastota 1 mi. SW	43	04	75	45	27		27			
29	Co	*Candor	42	14	76	21	15		15			
30	Co	*Canton	44	36	75	10	97	97	92			
31	Co	Cayuga Lock 1	42	57	76	44	32		32			
32	Co	Churchville	43	06	77	53	5		5			
33	Co	*Cincinnatus	42	32	75	54	22		22			
34	Co	Clyde Lock 26	43	04	76	50	41		41			
35	Co	Colden	42	40	78	41	--	X	X			soil temp.(X)
36	Co	*Colton 3 mi. N	44	35	74	57	25		25			
37	Co	Constantia	43	15	76	00	7		7			
38	Co	*Cortland	42	36	76	11	98	98	81			
39	Co	Dansville	42	34	77	42	41	38	41			
40	Co	Delta	43	17	75	27	40		40			
41	Co	Eagle Bay	43	46	74	49	6		6			
42	Co	Eagle Falls	43	54	75	11	34		34			
43	Co	*East Homer 1	42	42	76	07	19		19			
44	Co	*East Homer 2	42	43	76	07	10		10			
45	Co	Elma	42	51	78	39	17	17	17	6		evaporation (6)
46	Co	*Elmira	42	05	76	48	80	79	80			
47	SO	Elmira CAA Airport	42	10	76	54	19	11	19	X	X	p 15, 1:(X)
48	Co	Forestport	43	26	75	13	25		25			
49	Co	*Franklinville	42	21	78	27	10	10	10			
50	Co	Fredonia	42	26	79	22	72	72	63			
51	Co	Freeville 2 mi.NE	42	32	76	19	19		19			
52	Co	Fulton	43	19	76	25	33		33			
53	Co	Garbutt	43	01	77	47	5		5			
54	Co	Geneva Exp. Sta.	42	53	77	00	70	89	70			
55	FO	Geneva Sampson AFB	42	50	77	00	--	X	X	X	X	p 15, 1:(X)
56	Co	Gouverneur	44	20	75	28	53	22	53			
57	Co	Gowanda St. Hosp.	42	29	78	56	14	13	14			
58	Co	Gravesville 2 mi. N	43	16	75	07	9	9	9			humidity (X)
59	Co	Hammondsport 1 mi S	42	24	77	13	5		5			

No.	Class	Location	Lat N deg	min	Long W deg	min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref;yrs)
		NEW YORK cont.										
60	Co	Hemlock	42	47	77	37	61	61	61			
61	Co	Highmarket	43	35	75	31	35		35			
62	Co	Highmarket 1 mi. SE	43	35	75	30	19		19			
63	Co	Hilton	43	17	77	47	14	14	14			
64	Co	Hinckley	43	18	75	07	41		41			
65	Co	*Hoffmeister	43	23	74	43	53		53			
66	Co	Honeoye Falls	42	57	77	35	5		5			
67	Co	Hooker	43	41	75	45	27		27			
68	Co	Hornell Almond Dam	42	21	77	42	5		5			
69	Co	*Indian Lake 2 mi. SW	43	45	74	17	60	59	60			
70	Co	Ithaca Cornell Univ.	42	27	76	28	41	27	40	41		evap. (41), sunshine (X), pressure (X)
71	Co	*Lincklaen	42	41	75	53	6		6			
72	Co	Linden	42	52	78	10	40		40			
73	Co	Locke 4 mi. W	42	40	76	28	27		27			
74	Co	Lockport 2 mi. NE	43	11	78	39	73	67	73			
75	Co	Lowville	43	48	75	29	98	93	98			
76	Co	Lyons Falls	43	37	75	22	45		45			
77	Co	Macedon	43	04	77	18	40		40			
78	Co	Marcellus SCS	42	59	76	23	19		19			
79	Co	Mays Pt. Lock 25	43	00	76	46	40		40			
80	Co	Mt. Morris 2 mi. W	42	44	77	54	9	9	9			
81	Co	Newark	43	03	77	06	39		39			
82	Co	Newark Valley	42	13	76	12	4		4			
83	Co	New London Lock 22	43	12	75	37	39		39			
84	Co	Ogdensburg Hosp. 3 mi. NE	44	44	75	27	68	68	66			
85	Co	Old Forge 2 mi. SW	43	42	75	00	12	11	12			
86	Co	Ovid	42	40	76	50	27		27			
87	Co	Penn Yan	42	39	77	04	107	53	107			
88	Co	Prattsburg 2 mi. NW	42	32	77	18	18		18			
89	Co	Pulaski	43	34	76	08	--	X	X			
90	FO	Rochester Airport	43	07	77	20	130	129	130	88	88	p 15, 1:(88)
91	FO	Rome Griffiss AFB	43	14	75	25	16	16	16	16	16	p 15, 1:(16)
92	Co	Rushford 3 mi. SW	42	22	78	18	5		5			
93	Co	Sabattis 3 mi. NE	44	07	74	40	26		26			
94	Co	Sabattis Whitney Park	44	03	74	38	3	3	3			
95	Co	Saranac Lake	44	19	74	07	29	29	29			
96	Co	Scio	42	10	77	59	30		30			
97	Co	Sherman	42	10	79	36	8		8			
98	Co	Skaneateles	42	57	76	26	65		65			
99	Co	Sodus 2 mi. SSW	43	13	77	04	30	30	30			
100	Co	S. Edwards 1 mi. E	44	16	75	12	32		32			

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		NEW YORK cont.										
101	Co	S. Wales Emery Pk.	42	43	78	36	28	28	28			
102	Co	Stafford	42	59	78	05	28	28	28			
103	Co	Stillwater Reserv.	43	53	75	02	38	32	38			
104	FO	Syracuse Airport	43	07	76	07	71	71	62	62	62	p 15, 1:(62)
105	Co	Theresa	44	13	75	47	18		18			
106	Co	*Troupsburg 4 mi. NE	42	04	77	29	18		18			
107	Co	Truxton	42	43	76	02	19		19			
108	SO	Utica CAA Airport	43	09	75	23	19	X	19	X	X	p 15, 1:(X)
109	Co	Wales	42	45	78	31	17		17			
110	Co	Wanakena Ranger School	44	09	74	54	49	48	49			
111	Co	Warsaw 5 mi. SW	42	41	78	12	7	7	7			
112	Co	Waterloo	42	54	76	52	36		36			
113	Co	Watertown	43	58	75	52	69	67	69			
114	Co	Wellsville	42	07	77	57	3		3			
115	Co	Westfield 2 mi. SW	42	17	79	37	43	38	43			
116	Co	Whitesville	42	02	77	46	5		5			
117	Co	Wiscoy	42	30	78	05	19	19	19			
118	Co	Wolcott	43	14	46	49	20		20			
		ONTARIO					**	**	**	**	**	**
1	II	Agincourt	43	47	79	16	--	X	X	50		
2	III	Aldershot	43	18	79	54	--		X			
3	II	Aldershot (HEPC)	43	18	79	52	--	X	X			
4	II	Algonquin Park	45	35	78	33	--	31	31			
5	III	Alliston	44	08	79	58	--		X			
6	III	Alloa	43	43	79	52	--		X			
7	II	Alton	43	51	80	05	--	51	51			
8	II	Angus	44	19	79	52	--	X	X			
9	II	Apsley	44	46	78	05	--	X	X			
10	I	Armstrong	50	18	88	55	--	24	24	94	X	p 15, 1:(X)
11	II	*Atikokan	48	44	91	38	--	34	34			
12	II	Barrie	44	24	79	41	--	56	56			
13	II	*Bear Island	46	59	80	05	--	X	X			
14	II	Beatrice	45	08	76	16	--	66	66			
15	II	Beaverton	44	25	79	09	--	X	X			
16	II	Beeton	44	06	79	47	--	X	X			
17	III	Benny	46	31	81	38	--		X			
18	II	Bingham Chute	46	06	79	24	--	X	X			
19	II	Biscotasing	47	17	82	07	--	34	34			
20	II	Black Sturgeon Lk.	49	20	88	50	--	X	X			
21	II	Bradford	44	06	79	30	--	X	X			
22	II	Brampton	43	41	79	46	--	X	X			
23	II	Brantford	43	08	80	16	--	62	62			
24	II	Brockville	44	33	75	40	--	33	X			
25	III	Broddytown	43	37	79	36	--		X			
26	II	Brucefield	43	33	81	33	--	45	45			

** See Appendix II, p. 160

No.	Class	Location	Lat N deg	Lat N min	Long W deg	Long W min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		ONTARIO cont.					**	**	**	**	**	**
27	III	Burnhamthorpe	43	37	79	36	--		X			
28	II	Caledonia	43	06	79	57	--	X	X			
29	II	Cameron Falls	49	09	88	21	--	25	25			
30	III	Campbellford	44	18	77	48	--		X			
31	II	Canboro	42	59	79	35	--	X	X			
32	II	Caramat	49	37	86	09	--	X	X			
33	I	Centralia	43	18	81	31	--	X	X	X	X	p 15, 1:(X)
34	I	*Chalk River	46	00	77	26	--	20	21	50	X	sunshine (21); p 15, 1:(X)
35	II	Chapleau	47	50	83	25	--	35	35			
36	II	Chatham	42	23	82	12	--	59	71			sunshine (21)
37	II	Chatham (CFCO)	42	23	82	12	--	X	X			
38	III	Chatsworth	44	24	80	54	--		X			
39	II	Clarkson	43	33	79	37	--	X	X			
40	I	Clear Creek	42	35	80	34	--	X	X	X	X	p 15, 1:(X)
41	III	Clifford	43	57	80	58	--		X			
42	II	Coe Hill	44	53	77	50	--	X	X			
43	II	Coldwater	44	42	79	40	--	X	X			
44	II	Coniston	46	28	80	49	--	X	X			
45	II	Crystal Falls	46	27	79	55	--	X	X			
46	II	Delhi	42	52	80	32	--	X	X			sunshine (21)
47	III	Dog Lake Dam	48	05	89	38	--		X			
48	III	*Domville	44	47	75	32	--		X			
49	III	Dona	48	30	89	31	--		X			
50	III	Doon	43	24	80	27	--		X			
51	II	Dorset	45	15	78	53	--	X	X			
52	III	Dunnville	42	55	79	42	--		X			
53	II	Durham	44	13	80	48	--	X	X			
54	I	*Earlton	47	42	79	51	--	16	16	60	X	p 15, 1:(X)
55	III	Eugenia	44	18	80	33	--		34			
56	III	Fenelon Falls	44	23	78	44	--		X			
57	II	Fergus	43	48	80	20	--	X	X			
58	II	*Foleyet	48	15	82	26	--	X	X			
59	II	Forest	43	06	82	00	--	X	X			
60	II	Franz	48	27	84	24	--	30	30			
61	II	Galt	43	22	80	19	--	X	X			
62	II	Georgetown	43	38	79	55	--	44	73			
63	II	*Geraldton	49	42	86	53	--	X	X			
64	III	*Geraldton (HEPC)	49	46	86	57	--		X			
65	II	Gilmour	44	51	77	56	--	X	X			
66	II	Glencoe	42	42	81	42	--	X	X			
67	II	Gooderham	44	55	78	23	--	X	X			
68	III	Gore's Landing	44	08	78	13	--		X			
69	I	*Graham	49	16	90	35	--	X	X	X	X	p 15, 1:(X)
70	III	Green River	43	54	79	11	--		X			
71	III	Grey Co. Forest	44	07	80	48	--		X			
72	III	Grimsby (Rock Chapel)	43	09	79	42	--		X			

** See Appendix II, page 160.

No.	Class	Location	Lat N deg	min	Long W deg	min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		ONTARIO cont.					**	**	**	**	**	**
73	II	Guelph	43	33	80	16	--	55	55	105		sunshine (34)
74	III	Hagersville	43	00	80	03	--		X			
75	II	Haliburton	45	01	78	28	--	57	57			
76	II	Haliburton (2)	45	03	78	29	--	X	X			
77	II	Harrow	42	02	82	53	--	31	31			sunshine (32)
78	II	Helen Mine	48	04	84	45	--	X	X			
79	II	Holstein	44	03	80	46	--	X	X			
80	III	Hopeville	44	05	80	34	--		X			
81	III	Hornby	43	33	79	50	--		X			
82	II	*Hornepayne	49	14	84	51	--	31	31			
83	II	Huntsville	45	19	79	15	--	41	41			
84	III	Ilderton	43	07	81	23	--		X			
85	II	Jarvis Lake	49	15	87	49	--	X	X			
86	II	Kakabeka Falls	48	24	89	37	--	41	41			
87	II	Kemptville	45	02	75	39	--	X	X			
88	III	*Kenogami Dam	49	55	86	28	--		X			
89	II	Killala	49	09	86	28	--	X	X			
90	I	*Killaloe	45	34	77	24	--	16	16	50	X	p 15, 1:(X)
91	II	Kohler	42	56	79	52	--	X	X			
92	II	Lafontaine	44	45	80	05	--	X	X			
93	III	Lakeport	43	59	77	55	--		X			
94	II	Lindsay	44	20	78	44	--	68	68			sunshine (68)
95	II	Listowel	43	45	80	58	--	X	X			
96	I	London	43	02	81	09	--	65	65	52	X	p 15, 1:(X)
97	II	*Longlac	49	45	86	30	--	29	29			
98	II	*Longlac (P & P)	49	45	86	30	--	X	X			
99	II	Long Lake Control Dam	49	05	87	03	--	X	X			
100	II	Long Point	42	33	80	03	--	X	X	45		
101	II	Lucan	43	11	81	24	--	X	X			
102	II	Lucknow	43	58	81	31	--	58	58			
103	II	Macdiarmid	49	26	88	09	--	X	X			
104	II	McVittie	46	17	80	52	--	X	X			
105	II	*Madawaska	45	30	77	59	--	X	X			
106	II	Magnetawan	45	40	79	38	--	X	X			
107	I	Malton	43	41	79	38	--	17	17	69	X	humidity (X); p 15, 1:(X)
108	II	Manitou Falls	49	12	86	06	--	X	X			
109	III	*Mattagami Lake Dam	48	01	81	33	--		X			
110	II	Melville	43	55	80	03	--	X	X			
111	III	Meyersburg	44	17	77	48	--		X			
112	II	Midhurst	44	27	79	44	--	X	X			
113	III	Mildmay	44	03	81	07	--		X			
114	III	Miller Lake For.	45	05	81	25	--		X			
115	II	Millgrove	43	21	79	56	--	X	X			
116	III	Mink Lake	47	01	82	04	--		X			

** See Appendix II, p. 160

No.	Class	Location	Lat N deg	min	Long W deg	min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		ONTARIO cont.					**	**	**	**	**	**
117	II	Mitchell	43	28	81	11	--	X	X			
118	II	Montreal Falls	47	15	84	24	--	X	X			
119	II	*Montreal River	47	07	79	29	--	37	37			
120	III	*Moose Lake	48	50	91	36	--		X			
121	III	Morriston	43	28	80	07	--		X			
122	I	Muskoka	44	58	79	19	--	16	16	52	X	p 15, 1:(X)
123	I	*Nakina	50	11	86	42	--	16	16	57	X	humidity (X); p 15, 1:(X)
124	II	North Bay	46	19	79	28	--	28	34			
125	I	North Bay (A)	46	22	79	25	--	16	16	60	X	p 15, 1:(X)
126	II	Oak Ridges	43	58	79	28	--	30	30	90		sunshine (29)
127	II	Oil City	42	55	82	02	--	X	X			
128	II	Orillia	44	37	79	24	--	49	49			
129	II	Orono	43	59	78	35	--	X	X			
130	I	*Ottawa (Uplands)	45	20	75	41	--	76	76	72		sunshine (53)
131	II	Oxaline Lake	49	42	87	34	--	X	X			
132	I	*Pagwa	50	02	85	16	--	16	16	52	X	p 15, 1:(X)
133	II	Pays Plat	49	43	87	34	--	X	X			
134	II	Pefferlaw	44	19	79	13	--	X	X			
135	II	Peshu Lake	46	37	83	10	--	X	X			
136	II	Peterboro	44	17	78	19	--	66	71			
137	III	Peterboro (HEPC)	44	20	78	19	--		X			
138	II	Peters Corners	43	17	80	04	--	X	X			
139	III	Petrolia	42	57	82	05	--		X			
140	III	Pine Portage	49	18	88	19	--		X			
141	II	*Port Elmsley	44	53	76	08	--	X	X			
142	II	Portland	44	42	76	12	--	X	X			
143	II	Preston	43	40	80	25	--	X	X			
144	II	*Quorn	49	25	90	05	--	33	33			
145	II	Ragged Rapids	45	01	79	40	--	X	X			
146	III	Ramsay	46	58	82	21	--		X			
147	II	Ranger Lake	46	55	83	30	--	X	X			
148	III	Rayner	46	27	83	23	--		X			
149	III	Red Cedar Lake Dam	46	41	80	01	--		X			
150	II	Redickville	44	13	80	13	--	X	X			
151	III	*Rideau Ferry	44	51	76	09	--		X			
152	II	Ridgetown	42	26	81	55	--	X	X			
153	II	Ridgeville	43	04	79	08	--	X	X			
154	I	*Rockcliffe	45	28	75	38	--	14	14	X	X	p 15, 1:(X)
155	II	Ruel	47	18	81	27	--	33	33			
156	II	St. Catherines	43	09	79	17	--	33	32			sunshine (21)
157	II	St. Catherines (Path. Lab.)	43	10	79	17	--	X	X			
158	III	St. Joachim	42	10	82	38	--		X			
159	II	St. Thomas	42	48	81	11	--	X	X			
160	II	Sand Lake	47	47	84	32	--	X	X			
161	III	Sauble Forest	44	41	81	15	--		X			
162	III	Scotia Junction	45	31	79	17	--		X			
163	II	Simcoe	42	52	80	20	--	32	32			

** See Appendix II, p. 160.

No.	Class	Location	Lat N deg	min	Long W deg	min	Per of Rec	Temp Yrs	Pcpn Yrs	Wind Yrs	Wea Yrs	Other (ref:yrs)
		ONTARIO cont.					**	**	**	**	**	**
164	II	Smithfield	44	05	77	40	--	X	X			
165	II	Smoky Falls	50	04	82	10	--	X	X			
166	III	Snelgrove	43	45	79	50	--		X			
167	II	Stayner	44	28	80	06	--	X	X			
168	I	Stirling	44	19	77	38	--	15	15	55	X	p 15, 1:(X)
169	II	Stratford	43	23	81	00	--	X	X			
170	II	Strathroy	42	58	81	38	--	X	X			
171	I	Sudbury	46	29	80	59	--	27	27	X	X	p 15, 1:(X)
172	III	Talbotville	42	48	81	15	--		X			
173	III	Toronto (Downsview South)	43	43	79	29	--		X			
174	II	Toronto (East York)	43	42	79	20	--	X	X			
175	III	Toronto (Glenview)	43	42	79	27	--		X			
176	II	Toronto (Islington West)	43	39	79	33	--	X	X			
177	III	Toronto (Kingsway)	43	39	79	31	--		X			
178	III	Toronto (Scarlett Road)	43	40	79	30	--		X			
179	II	Toronto (South Leaside)	43	42	79	22	--	X	X			
180	III	Toronto (Wexford)	43	45	79	18	--		X			
181	III	Toronto (Willowdale)	46	47	79	26	--		X			
182	II	Toronto (Wilson Heights)	43	44	79	26	--	X	X			
183	III	Trethewey Falls	44	59	79	17	--		X			
184	II	Turbine	46	23	81	34	--	34	34			sunshine (30)
185	II	Tweed	44	30	77	19	--	X	X			
186	III	Unionville	43	52	79	20	--		X			
187	II	*Upsala	49	03	90	28	--	X	X			
188	II	Uxbridge	44	07	79	06	--	X	X			
189	II	Vineland	43	10	79	19	--	X	X			sunshine (35)
190	II	Walkerton	44	03	81	09	--	33	33	70		
191	II	Wallaceburg	42	35	82	24	--	41	41			
192	III	Wasdells	44	47	79	18	--		X			
193	III	Washago	44	35	79	20	--		X			
194	III	Waterford	42	58	80	17	--		X			
195	II	Waterloo	43	28	80	27	--	X	X			
196	II	Welland	42	59	79	17	--	56	56			
197	I	White River	48	35	85	17	--	62	62	55	X	p 15, 1:(X)
198	I	Windsor	42	17	82	58	--	X	59	18	X	p 15, 1:(X)
199	II	Woodbridge	43	50	79	36	--	X	X			
200	II	Woodslee	42	13	82	42	--	X	X			
201	II	Woodstock	43	08	80	47	--	76	76			sunshine (58)

** See Appendix II, p. 160

Table 3. Unusable Data Sources.

The facilities listed in Table 3 are those that were uncovered by the project but which were adjudged to be unsuitable for inclusion in Tables 1 or 2. One of three situations described the reason for deletion. Most of the sources were contacted, but the data recorded by the installations were of such short record or of such a nature that there was no immediate future use deemed possible for it by the investigators. These cases are listed in the first column. In a few cases, data of interest to the project are taken, but for technical reasons, such as intake location or instrument exposure, they were considered unrepresentative. These are shown in the second column. In a few cases the existence of potential data sources was determined, but for a variety of reasons no contact with source authorities was possible. Only 16 cases of this type occurred -- 1.4 per cent of the total of 1177 sources.

Table 3. Unusable Data Sources

Location	Installation	Few or No Data	Data Not Repres.	No Contact
Red Rock, Ont.	St. Lawrence Corp.			X
Port Arthur, Ont.	Abitibi Pulp & Paper Co.			X
Port Arthur, Ont.	Provincial Paper Co.			X
Grand Marais, Ont.	water treatment plant			X
Two Harbors, Minn.	municipal power plant			X
Ontonagon, Mich.	water treatment plant	X		
Eagle River, Mich.	water treatment plant	X		
Eagle Harbor, Mich.	water treatment plant	X		
Copper Harbor, Mich.	water treatment plant	X		
Gay, Mich.	water treatment plant	X		
Pequaming, Mich.	water treatment plant	X		
Sault Ste. Marie, Ont.	Algoma Steel Co.			X
Nahma, Mich.	water treatment plant	X		
Waukegan, Ill.	Commonwealth Edison Co.	X		
Great Lakes NTS	power plant	X		
Winnetka, Ill.	municipal power plant			X
East Chicago, Ind.	water treatment plant			X
Indiana Harbor, Ind.	Youngstown Sheet & Tube Company	X		
Ludington, Mich.	Dow Chemical Co.		X	
Muskegon, Mich.	Consumers Power Co.		X	
Essexville, Mich.	Consumers Power Co.		X	
Traverse City, Mich.	municipal power plant	X		
Alpena, Mich.	Huron Portland Cement Co.			X
East Tawas, Mich.	water treatment plant	X		
Lorain, Ohio	National Tube Co.	X		
Painesville, Ohio	Industrial Rayon Corp.			X
Ashtabula, Ohio	Union Carbide and Carbon Corp.			X
Erie, Penn.	Pennsylvania Elec. Co.	X		
Dunkirk, N. Y.	water treatment plant	X		
Buffalo, N. Y.	water treatment plant	X		
Buffalo, N. Y.	Republic Steel Co.	X		
Wilson, N. Y.	water treatment plant	X		
Newfane, N. Y.	water treatment plant	X		
Barker, N. Y.	water treatment plant	X		
Lyndonville, N. Y.	water treatment plant	X		
Brockport, N Y.	water treatment plant	X		
Hilton, N. Y.	water treatment plant	X		
Williamson, N. Y.	water treatment plant	X		
Sodus Point, N. Y.	water treatment plant	X		
Wolcott, N. Y.	water treatment plant	X		
Oswego, N. Y.	water treatment plant	X		
Sacketts Harbor, N. Y.	water treatment plant	X		
Oshawa, Ont.	General Motors of Canada			X
Oshawa, Ont.	Oshawa Public Utilities			X
Hamilton, Ont.	Steel Co. of Canada			X
(unknown)	Upper Peninsula Generating Co.			X
(unknown)	Produce Terminal Co.			X

5. SUMMARY

The entire Great Lakes drainage basin was reviewed for sources of hydrographic and meteorological data, potentially applicable to studies of Great Lakes hydrography and fisheries. Agencies which were found to obtain either or both of these types of data were: water treatment plants; power plants; industrial concerns; U. S. Coast Guard; paper mills; Sanitary District Observers; U. S. Weather Bureau First Order, Second Order and Cooperative stations; Canadian Meteorological Division Class I, II, III, and c stations; U. S. Lake Survey; Canadian Hydrographic Service; U. S. Geological Survey; Canadian Department of Northern Affairs and National Resources, Water Resources Branch; independent research installations; and several miscellaneous uncategorized agencies.

Tables 4 and 5 present a summarization of knowledge of data sources appearing in Tables 1, 2, and 3. Table 4, entitled Summary of Knowledge of All Potential Data Sources, indicates the number and per cent of agencies contained within each source type that have usable or unusable data and those agencies with which no contact was possible (no contact). Following the format utilized throughout this report, these agencies have been categorized as either onshore or inland. Entries appearing in the usable column have been derived from Tables 1 and 2. Entries in the unusable column have been derived from the first two columns of Table 3, and entries in the no contact column, from the third column of Table 3.

For example, 97 water treatment plants were located which utilize Great Lakes water. These plants constituted 8.3 per cent of the total potential sources located. Of these, 73 (75 per cent) possessed usable data, 22 (23 per cent) possessed no data of use to the purposes of this investigation, and 2 (2 per cent) could not, for various reasons, be adequately ascertained.

A total of 1177 separate possible data sources were located in the drainage basin. Of the total, slightly less than half (44.2 per cent) are located within two miles of the Lake shores (onshore), whereas 55.8 per cent are more than two miles from the shoreline (inland).

A high percentage of all onshore agencies have proved to possess apparently usable meteorological and/or hydrographic data, namely, 91 per cent; only 6 per cent of the reviewed data is unusable and 3 per cent is for plants with which no contact was established.

The percentage distribution of onshore agencies by type of installation is of interest as shown in Table 4. The Coast Guard, meteorological substations, and water treatment plants all represent, numerically, data sources of the same order of magnitude. The numbers of data to be found in power plants and industries, and from the U. S. Lake Survey and the Canadian Hydrographic Service are each about half of the percentage represented by the aforementioned three source types. Other meteorological sources and the Sanitary District Observers are, in turn, nearly equal and each less than half the percentage of the latter two source types. There are very few paper mills, research, and special organizations that were uncovered as data sources by the project (together about 1 per cent of the total).

Table 4

Summary of Knowledge of All Potential Data Sources

TYPE OF INSTALLATION	USABLE No.	USABLE %	UNUSABLE No.	UNUSABLE %	NO CONTACT No.	NO CONTACT %	TOTAL No.	TOTAL %
ONSHORE								
Water treatment plants	73	75	22	23	2	2	97	8.3
Power plants and industries	34	62	10	18	11	20	55	4.7
U. S. Coast Guard	124	100	0	0	0	0	124	10.5
Paper mills	3	50	0	0	3	50	6	0.5
Sanitary District Observers	21	100	0	0	0	0	21	1.8
U. S. Weather Bureau 1st & 2nd Order, U.S. Naval & Air Force Bases, Canadian Meteorological Division I	24	100	0	0	0	0	24	2.0
U. S. Weather Bureau Cooperatives, Canadian Meteorological Division II, III, c	132	100	0	0	0	0	132	11.2
U. S. Lake Survey, Canadian Hydrographic Service	55	100	0	0	0	0	55	4.7
Other (research, individuals)	6	100	0	0	0	0	6	0.5
TOTAL ONSHORE	472	90.8	32	6.2	16	3.0	520	44.2
INLAND								
U. S. Weather Bureau 1st & 2nd Order, U.S. Naval & Air Force Bases, Canadian Meteorological Division I	67	100	0	0	0	0	67	5.7
U. S. Weather Bureau Cooperatives, Canadian Meteorological Division II, III, c	585	100	0	0	0	0	585	49.7
Research installations	5	100	0	0	0	0	5	0.4
TOTAL INLAND	657	100	0	0	0	0	657	55.8
TOTAL ONSHORE AND INLAND SOURCES	1129	95.9	32	2.7	16	1.4	1177	100.0

The 657 inland sources are, with the exception of five research installations, U. S. Weather Bureau, U. S. Naval Air, U. S. Air Force, or Canadian Meteorological Division stations. Data for all stations are usable, and all except those taken by the research groups are published.

The USWB Cooperatives and CMD Class II, III, and c stations comprise by far the largest single source of data ascertained by the project. This source represents half of the total number of hydrographic and meteorological stations existing within the Great Lakes watershed. Data recorded by these stations, while few in variety, are basic to future studies that may examine applicability of meteorological parameters to hydrographic and fisheries problems.

Table 5, entitled Summary of Knowledge of Usable Data Sources, presents a breakdown of sources from which data of apparent use to studies of Great Lakes hydrography and meteorology are available. Entries in this table have, as in Table 4, been categorized as onshore or inland, and are presented in terms of absolute number and per cent of total for each type agency.

The principal difference between Table 5 and Table 4 is the effect of the 47 water and power plant installations for which there were few usable data or with which no contact was established. These are not accounted for in Table 5 which shows the percentage distribution for usable data sources only. The reduction in numbers is reflected by the drop from 8.3 per cent in Table 4 to 6.5 per cent of the total in Table 5. Power plant and industries percentage took an even greater proportionate drop since 21 of the 55 plants possessed few usable data or else no contact could be established with plant personnel.

The results of this investigation are displayed in Tables 1, 2, and 3. The following data sources are not included in the Tables for reasons given on p. 110:

1. River discharge information obtainable from the U. S. Geological Survey and Canada Department of Northern Affairs and National Resources.
2. Information relating to meteorological observations obtained by lake freighters and other vessels.

Table 1 lists the sources of usable hydrographic and/or meteorological data that are located within two miles of the lake shores.

Table 2 lists the sources of usable meteorological data located more than two miles from the lake shores, but within the confines of the Great Lakes drainage basin. There are certain exceptions, namely, 126 U. S. Weather Bureau and Canadian Meteorological Division weather stations which lie just outside the limits of the drainage basin, but have been included in the compilation to provide more complete coverage in certain areas.

Table 3 lists the potential sources which were investigated and found to possess no usable data. This table also includes those agencies with which suitable liason or contact could not be established.

Table 5

Summary of Knowledge of Usable Data Sources

TYPE OF INSTALLATION	FREQUENCY OF USABLE DATA SOURCES No.	%
ONSHORE		
Water treatment plants	73	6.5
Power plants and industries	34	3.0
U. S. Coast Guard	124	11.0
Paper mills	3	0.3
Sanitary District Observers	21	1.9
U. S. Weather Bureau 1st & 2nd Order, U. S. Naval & Air Force Bases, Canadian Meteorological Division I	24	2.1
U. S. Weather Bureau Cooperatives, Canadian Meteorological Division II, III, c	132	11.7
U. S. Lake Survey, Canadian Hydrographic Service	55	4.9
Other (research, individuals)	6	0.5
TOTAL ONSHORE	472	41.9
INLAND		
U. S. Weather Bureau 1st & 2nd Order, U. S. Naval & Air Force Bases, Canadian Meteorological Division I	67	5.9
U. S. Weather Bureau Cooperatives, Canadian Meteorological Division II, III, c	585	51.8
Research installations	5	0.4
TOTAL INLAND	657	58.1
TOTAL ONSHORE AND INLAND SOURCES	1129	100.0

Figure 8 is a histogram of the information contained in Table 4. The contribution of each type of data source is shown by percentage frequency distribution. The open portion of each bar indicates the percentage of usable sources, and the shaded portions indicate the percentages of unusable and "no contact" sources.

Figure 9, also a histogram, summarizes the percentage of usable, unusable, and no contact sources for (1) the onshore sources, (2) the inland sources, and (3) the total sources for the entire drainage basin.

A bibliography is appended to this report which gives references on the subjects of hydrography and meteorology as they pertain to potentially applicable scientific problems of the Great Lakes.

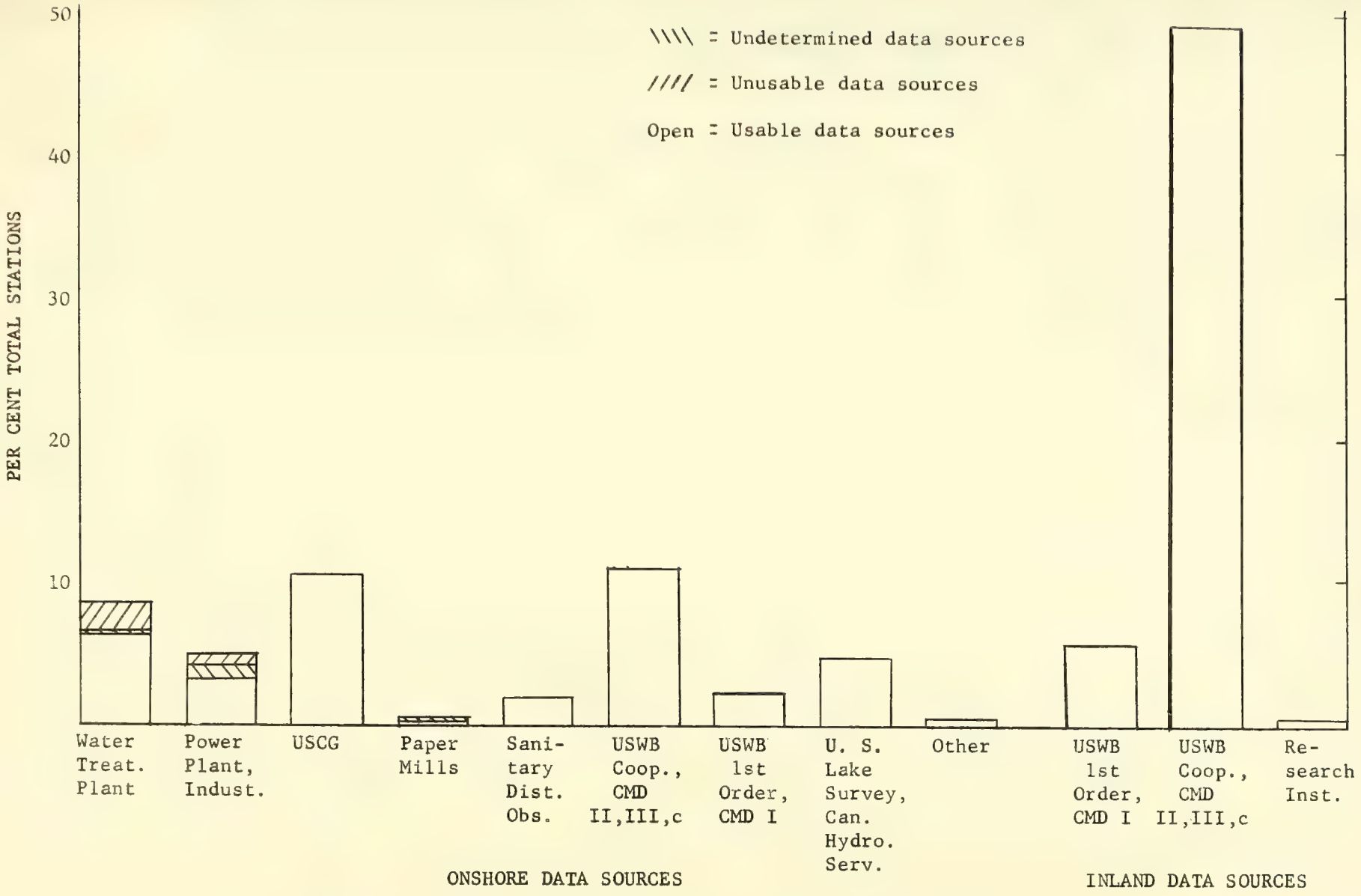

Figure 8. Per cent frequency of all potential data sources.

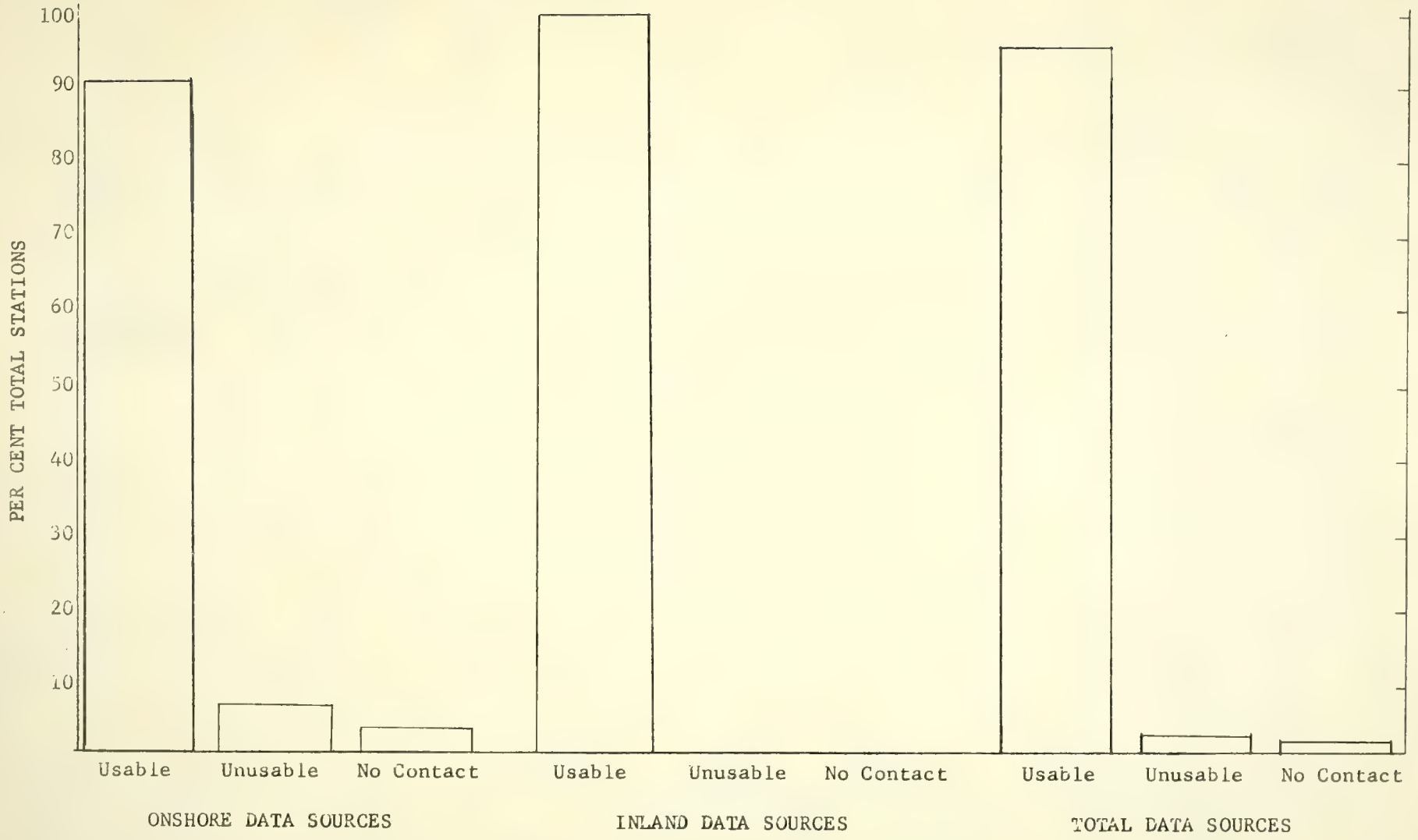

Figure 9. Summary of knowledge of all potential data sources.

Appendix I

BIBLIOGRAPHY

Lake Superior

Adams, C. C., 1909. Isle Royale as a biotic environment. Rept. St. Bd. Geol. Surv. Mich. (1908):1-56.

Eddy, S., 1934. A study of fresh-water plankton communities. Bull. Univ. Ill., 31(45), Ill. Biol. Monog., 12(4):93 pp.

_____ , 1943. Limnological notes on Lake Superior. Proc. Minn. Acad. Sci., 11:34-39.

Mather, W. W., 1848. Notes and remarks connected with meteorology on Lake Superior, and on the variations in its level by barometric causes, and variations in the season. Am. Jour. Sci. Arts, 2d. Ser., 6(16):1-20.

McLaughlin, A. J., 1912. Sewage pollution of interstate and international waters with special reference to the spread of typhoid fever. II. Lake Superior and St. Marys River. III. Lake Michigan and the Straits of Mackinac. IV. Lake Huron, St. Clair River, Lake St. Clair, and the Detroit River. V. Lake Ontario and St. Lawrence River. U. S. Treasure Dept., Hyg. Lab., Bull. (83):296 pp.

Michigan Water Resources Commission, 1954. Great Lakes water temperatures at municipal sources along Michigan's shoreline. Mich. Water Res. Comm.:50 pp.

Nichols, W. R., 1883. On the temperature of fresh-water ponds and lakes. Proc. Boston Soc. Nat. Hist. (1880-1882), 21:53-82.

Odenbach, F. L., 1905. Some temperatures taken on Lake Huron and Superior in July and August of 1904. Monthly Weather Rev., 33:154.

Pettis, C. R., 1940. Typical quantitative analysis as applied to Lake Superior. Hydrology of the Great Lakes--A symposium. Trans. Am. Soc. Civil Engrs., 105(2074):795-806.

Ruschmeyer, O. R., T. A. Olson, and H. M. Bosch, 1957. Lake Superior study, summer of 1956, with a memorandum and recommendations by A. C. Redfield and a detailed literature review by T. Odlaug. In: Summary of report--preliminary limnological study. School of Public Health, Univ. Minn. Mimeographed.

Schaller, W. T., 1915. The supposed vanadic acid from Lake Superior is copper oxide. Am. Jour. Sci., 4th. Ser., 39(232):404-406.

Smith, S. I., and A. E. Verrill, 1871. Notice of the invertebrata dredged in Lake Superior in 1871, by the U. S. Lake Survey, under the direction of Gen. C. B. Comstock, S. I. Smith Naturalist. Am. Jour. Sci. Arts, 3d. Ser., 2:448.

Smith, S. I., 1871. Preliminary report on the dredgings in Lake Superior. Rept. (U. S.) Sec. War (1871), Pt. 2:1-7.

_____, 1871. Dredging in Lake Superior under the direction of the U. S. Lake Survey. Am. Jour. Sci. Arts, 3d. Ser., 2:373-374.

_____, 1871. The fauna of Lake Superior at great depths. Am. Nat., 5:722.

_____, 1874. The crustacea of the fresh waters of the United States. Rept. U. S. Comm. Fish. (1872-1873), Pt. 2:637-665.

_____, 1874. Sketch of the invertebrate fauna of Lake Superior. Rept. U. S. Comm. Fish. (1872-1873), Pt. 2:690-707.

Taylor, W. R., 1935. Phytoplankton of Isle Royale. Trans. Am. Micr. Soc., 54(2):83-97.

Teschemacher, J. E., 1851. On the vanadium minerals from Lake Superior. Am. Jour. Sci., 2d. Ser., 11(32):233-234.

U. S. Commission of Fish and Fisheries, 1899. Lake Superior. Rept. U. S. Comm. Fish. (1898), Pt. 24:CXLII-CXLIII.

Whittlesey, C., 1851. On the superficial deposits of the northwestern part of the United States. Proc. Am. Assoc. Adv. Sci., 5:54-59.

Wright, S., 1931. Bottom temperatures in deep lakes. Science, N. S., 74 (1921):413.

Lake Michigan

Anonymous, 1925. The technical bases for the recommendations of the Board of Review. Pt. 2. Rept. Eng. Bd. Rev., Sanitary District Chicago, on the lake lowering controversy and a program of remedial measures.:109 pp.

_____, 1954. Great Lakes fishery investigations. Fishery and limnological survey of southern Lake Michigan ("Cisco" Cruise V). Com. Fish. Rev., 16(10):25-26.

_____, 1954. Great Lakes fishery investigations. Experimental gill-netting and trawling in southern Lake Michigan ("Cisco" Cruises VI and VII). Com. Fish. Rev., 16(11):29-31.

_____, 1955. Great Lakes fishery investigations: Fewer chubs found in shallow Lake Michigan water during fall ("Cisco" Cruises X and XI). Com. Fish. Rev., 17(2):24-25.

_____, 1955. Great Lakes fishery investigations: Fishery conditions in northern Lake Michigan explored by "Cisco" (Cruises 3, 4, 5, 6). Com. Fish. Rev., 17(10):51-53.

_____, 1955. Great Lakes fishery investigations: Survey of northern Lake Michigan continued by "Cisco" (Cruise 9). Com. Fish. Rev., 17(11):31-32.

_____, 1956. Great Lakes fishery investigations: "Cisco" returns from survey trip of northern Lake Michigan (Cruise 11). Com. Fish. Rev., 18(1):26-27.

_____, 1956. Great Lakes fishery investigations. M/V "Cisco" tries to locate summer grounds of walleye in Lake Huron (Cruise 5). Lake Huron investigations continued by M/V "Cisco" (Cruise 6). Com. Fish. Rev., 18(11):38-39.

Babcock, H. H., 1871. On the effect of the reversal of current of the Chicago river on the hydrant water. The Lens.

Bading, G. A., 1909. Water conditions at Milwaukee. In: 1st. Rept. Lake Mich. Water Comm., by E. Bartow, H. E. Barnard, and F. W. Shumway:36-39.

Barnard, H. E., and J. H. Brewster, 1909. The character of the water supply of Michigan City, Ind. In: 1st. Rept. Lake Mich. Water Comm., by E. Bartow, H. E. Barnard, and F. W. Shumway:133-189.

_____, 1909. The sanitary condition of the southern end of Lake Michigan, bordering Lake County, Indiana. In: 1st. Rept. Lake Mich. Water Comm., by E. Bartow, H. E. Barnard, and F. W. Shumway:191-266.

Bartow, E., 1909. Report on water conditions in Illinois. In: 1st. Rept. Lake Mich. Water Comm., by E. Bartow, H. E. Barnary, and F. W. Shumway:40-62.

_____, 1909. Methods of water analysis. In: 1st. Rept. Lake Mich. Water Comm., by E. Bartow, H. E. Barnard, and F. W. Shumway:96-108.

_____, 1911. Chemical and biological survey of the waters of Illinois (1909 and 1910). Water Surv. Ser. (8), Bull. Univ. Ill., 8(23):148 pp.

_____, and L. E. Birdsall, 1911. Composition and treatment of Lake Michigan water. 2d. Rept. Lake Mich. Water Comm. (1911):69-86.

Bartow, E., 1912. Chemical and biological survey of the waters of Illinois (1911). Water Surv. Ser. (9), Bull. Univ. Ill., 9(20):173 pp.

Baylis, J. R., and H. M. Gerstein, 1929. Micro-organisms in the lake water at Chicago. Municipal News and Water Works, 76:291-296.

Birge, E. A., 1882. Notes on crustacea in Chicago water supply with remarks on the formation of the carapace. Chicago Med. Jour. and Examiner (1881), 43:584-590.

Bowles, J. T-B., 1909. Investigation of typhoid fever epidemic at Sheboygan, Wisconsin. In: 1st. Rept. Lake Mich. Water Comm., by E. Bartow, H. E. Barnard, and F. W. Shumway:90-95.

Church, P. E., 1942. The annual temperature cycle of Lake Michigan. I. Cooling from late autumn to the terminal point, 1941-42. Univ. Chicago Inst. Meteorol., Misc. Rept. (4):48 pp.

_____, 1945. The annual temperature cycle of Lake Michigan. II. Spring warming and summer stationary periods, 1942. Univ. Chicago Dept. Meteorol., Misc. Rept. (18):100 pp.

_____, 1945. Steam-fog over Lake Michigan. Trans. Am. Geophys. Union, 26:353.

_____, 1946. The annual temperature cycle in Lake Michigan. Trans. Am. Geophys. Union, 27:109-110.

Crohurst, H. R., and M. V. Veldee, 1927. Report of an investigation of the pollution of Lake Michigan in the vicinity of South Chicago and the Calumet and Indiana Harbors, 1924-1925. U. S. Publ. Health Bull. (170):134 pp.

Domogalla, B. P., E. B. Fred, and W. H. Peterson, 1926. Seasonal variations in the ammonia and nitrate content of lake waters. Jour. Am. Water Works Assoc., 15(4):369-385.

Eddy, S., 1927. The plankton of Lake Michigan. Bull. Ill. St. Div. Nat. Hist. Surv., 17(4):203-232.

Eggleton, F. E., 1936. The deep-water bottom fauna of Lake Michigan. Pap. Mich. Acad. Sci. Arts, Lett. (1935), 21:599-612.

_____, 1937. Productivity of the profundal benthic zone in Lake Michigan. Pap. Mich. Acad. Sci. Arts, Lett. (1936), 22:593-611.

Evans, W. A., 1909. Lake Michigan water for drinking purposes. Jour. Am. Med. Assoc., 53:1091-1093.

Gehrmann, A., 1909. An experiment in chemical purification of water. In: 1st. Rept. Lake Mich. Water Comm., by E. Bartow, H. E. Barnard, and F. W. Shumway:120-124.

Goddard, L. W., 1916. Currents in Lake Michigan. Paper presented before Grand Rapids(Mich.) Eng. Soc., May 24, 1916.

Griffith, R. E., 1955. Analysis of phytoplankton yields in relation to certain physical and chemical factors of Lake Michigan. Ecol., 36(4):543-552.

Hoy, P. R., 1872. Deep-water fauna of Lake Michigan. Trans. Wis. Acad. Sci. Arts, Lett. (1870-1872), 1:98-101.

Kofoid, C. A., 1896. A report upon the Protozoa observed in Lake Michigan and the inland lakes in the neighborhood of Charlevoix, during the summer of 1894. App. 2 to: A biological examination of Lake

Michigan in the Traverse Bay region, by H. B. Ward. Bull. Mich. Fish Comm. (6):76-84.

Lackey, J. B., 1944. Quality and quantity of plankton in the south end of Lake Michigan in 1942. Jour. Am. Water Works Assoc., 36:669-674.

Lapham, I. A., 1844. Wisconsin: A geographical and topographical description of Wisconsin with brief sketches of its history, geology, mineralogy, natural history, etc.:158-167. Milwaukee.

Lauff, G. H., 1957. Some aspects of the physical limnology of Grand Traverse Bay. Publication no. 2, Great Lakes Research Institute, Univ. Mich.:56 pp.

McLaughlin, A. J., 1912. Sewage pollution of interstate and international waters with special reference to the spread of typhoid fever. II. Lake Superior and St. Marys River. III. Lake Michigan and the Straits of Mackinac. IV. Lake Huron, St. Clair River, Lake St. Clair, and the Detroit River. V. Lake Ontario and St. Lawrence River. U. S. Treasury Dept., Hyg. Lab., Bull. (83):296 pp.

Michigan Water Resources Commission, 1954. Great Lakes water temperatures at municipal sources along Michigan's shoreline. Mich. Water Res. Comm.:50 pp.

Mohlman, F. W., and C. C. Ruchhoft, 1927. The quality of Lake Michigan water, raw and treated, from Waukegan to Gary. Proc. Lake Mich. Sanitation Congr., 3(2), (Apr.).

_____, 1927. The quality of Lake Michigan water, raw and treated, from Waukegan to Gary during 1926. Proc. Lake Mich. Sanitation Congr., 3(4):31-47.

Palmer, A. W., 1903. Chemical survey of the waters of Illinois. Report for the years of 1897-1902. Bull. (2), Univ. Ill.:254 pp.

Pearse, L., F. O. Tonney, and E. Bartow, 1911. Report on sanitary survey of Lake Michigan. Chicago to Waukegan. In:2d. Rept. Lake Mich. Water Comm.:39041.

Peterson, W. H., E. B. Fred, and B. P. Domogalla, 1925. The occurrence of amino acids and other organic nitrogen compounds in lake water. Jour. Biol. Chem., 63(2):287-295.

Stimpson, W., 1871. On the deep-water fauna of Lake Michigan. Am. Nat. (1870-1871), 4(7):403-405.

Thomas, B. W., and H. H. Chase, 1886. Diatomaceae of Lake Michigan as collected during the last sixteen years from the water supply of the city of Chicago. Chicago, 1886. Also:Notarisia, Commentarium Phycologicum, Anno, 2(6):328-330, 1887. Venezia, Italia.

Thomas, N. A., 1940. Taste and odor control on Lake Michigan. Jour. Am. Water Works Assoc., 32(7):1183-1186.

Townsend, C. McD., 1913-14. Effect upon the climate of the Lake States by a change in the natural current of Lake Michigan. U. S. House Representatives, 63rd. Congr., 2d. Sess., Doc. (762), App. C:40-71.

_____, 1916. The currents of Lake Michigan and their influence on the climate of the neighboring states. Jour. West. Soc. Engrs., 21:293-309.

Ward, H. B., 1896. A biological examination of Lake Michigan in the Traverse Bay region. Bull. Mich. Fish Comm. (6):1-71.

Ward, R. H., 1879. Purity of lake water. Amer. Naturalist. pp. 534-535.

Whittlesey, C., 1851. On the superficial deposits of the northwestern part of the United States. Proc. Am. Assoc. Adv. Sci., 5:54-59.

Williamson, B. L., and J. Greenbank, 1939. Investigation of the pollution of the Fox and East rivers and of Green Bay in the vicinity of the city of Green Bay, 1938-1939. Wis. St. Comm. Water Pollution, St. Bd. Health, and Green Bay Metropolitan Sewerage Comm.:242 pp.

Wright, S., 1931. Bottom temperatures in deep lakes. Science, N. S., 74(1921):413.

Lake Huron

Berry, A. E., 1951. Survey of industrial wastes in the Lake Huron-Lake Erie section of the international boundary waters. Pt. 1. Introduction and Canadian section. Sewage and Indust. Wastes, 23(4):508-517.

Black, H. H., and L. F. Oeming, 1951. Survey of industrial wastes in the Lake Huron-Lake Erie section of the international boundary water. Pt. 2. United States section. Sewage and Indust. Wastes, 23(4):517-535.

Cooper, W. F., 1905. Air and water temperatures. Rept. Mich. Acad. Sci. (1905):1-9.

_____, 1905. The variation of land and water temperatures. Rept. Mich. Acad. Sci. (7):40-43.

Drummond, A. T., 1889. Temperatures in Lake Huron. Nature, 39:582. London.

Ellis, J. B., and E. M. Sutherland, 1951. Report of the International Joint Commission, U. S. and Canada, on the pollution of boundary waters. 312 pp.

Fry, F. E. J., and J. C. Budd, 1953. Preliminary reconnaissance of the waters of Georgian Bay. Paper presented at Ann. Meeting Am. Soc. Limnol. Oceanog., Madison, Wis., Sept. 7.

Fry, F. E J., 1956. Movements of drift cards in Georgian Bay in 1953. Jour. Fish. Res. Bd. Can., 13(1):1-5.

International Joint Commission, 1914. Progress report--in re the pollution of boundary waters--including report of the sanitary experts. Government Printing Office, Jan. 16, 1914:388 pp. Wash.

_____, 1918. Pollution of boundary waters. Report of the consulting sanitary engineer upon remedial measures. Government Printing Office, Mar. 8, 1916:159 pp. Wash.

McLaughlin, A. J., 1912. Sewage pollution of interstate and international waters with special reference to the spread of typhoid fever. II. Lake Superior and St. Marys River. III. Lake Michigan and the Straits of Mackinac. IV. Lake Huron, St. Clair River, Lake St. Clair, and the Detroit River. V. Lake Ontario and St. Lawrence River. U. S. Treasury Dept., Hyg. Lab., Bull. (83):296 pp.

Michigan Water Resources Commission, 1954. Great Lakes water temperatures at municipal sources along Michigan's shoreline. Mich. Water Res. Comm.:50 pp.

Odenbach, F. L., 1905. Some temperatures taken on Lake Huron and Superior in July and August of 1904. Monthly Weather Rev., 33:154.

Wright, S., 1931. Bottom temperatures in deep lakes. Science, N. S., 74(1921):413.

Lake Erie

Andrews, T. F., 1948. Temporary changes in certain limnological conditions in western Lake Erie produced by a windstorm. Ecol, 29(4):501-505.

Anonymous, 1929. Preliminary report on Lake Erie Cooperative Survey. U. S. Fish. Serv. Bull. (173):2.

Berry, A. E., 1951. Survey of industrial wastes in the Lake Huron-Lake Erie section of the international boundary waters. Pt. 1. Introduction and Canadian section. Sewage and Indust. Wastes, 23(4): 508-517.

Black, H. H., and L. F. Oeming, 1951. Survey of industrial wastes in the Lake Huron-Lake Erie section of the international boundary waters. Pt. 2. United States section. Sewage and Indust. Wastes, 23(4):517-535.

Blunt, W. T., 1897. Effect of gales on Lake Erie. Rept. U. S. Deep Waterways Comm. (1896):155-168.

Britt, N. W., 1955. Stratification in western Lake Erie in summer of 1953: effects on the Hexagenia (Ephemeroptera) population. Eco., 36(2):239-244.

_____, 1955. Hexagenia (Ephemeroptera) population recovery in western Lake Erie following the 1953 catastrophe. Ecol., 36(3):520-522.

Brown, E. H., Jr., 1953. Survey of the Bottom fauna of the mouths of ten Lake Erie south shore rivers: its abundance, composition, and use as index of stream pollution. Lake Erie pollution survey-final report. Chapt. 5:156-170. Ohio Dept. Nat. Res.

Burgess, P., 1908. Report of examination of water purification plants. In: Report of an investigation of water and sewage purification plants in Ohio, 1906-1907, by Ohio St. Bd. Health:45-328.

Burkholder, P. R., 1929. Microplankton studies of Lake Erie. In: Preliminary report on the cooperative survey of Lake Erie--season of 1928. Bull. Buffalo Soc. Nat. Sci., 14(3):73-93. Also in: A preliminary report on the joint survey of Lake Erie. Suppl. 18th Ann. Rept. (1928), N. Y. Cons. Dept.:60-66, 1929.

_____, 1929. Biological significance of the chemical analyses. In: Preliminary report on the cooperative survey of Lake Erie--season of 1928. Bull. Buffalo Soc. Nat. Sci., 14(3):65-72.

_____, 1930. A biological survey of Lake Erie. Science, N. S., 71 (1837):288-289.

Carman, J. E., 1930. Drainage changes in the Toledo region. Ohio Jour. Sci., 30:187-193.

Chandler, D. C., 1940. Limnological studies of western Lake Erie. I. Plankton and certain physical-chemical data of the Bass Islands region, from September, 1938, to November, 1939. Ohio Jour. Sci., 40(6):291-336.

_____, 1942. Limnological studies of western Lake Erie. II. Light penetration and its relation to turbidity. Ecol, 23(1):41-52.

_____, 1942. Limnological studies of western Lake Erie. III. Phytoplankton and physical-chemical data from November, 1939, to November, 1940. Ohio Jour. Sci., 42(1):24-44.

_____, 1944. Limnological studies of western Lake Erie. IV. Relation of limnological and climatic factors to the phytoplankton of 1941. Trans. Am. Micr. Soc., 63(3):203-236.

_____, and O. B. Weeks, 1945. Limnological studies of western Lake Erie. V. Relation of limnological and meteorological conditions to the production of phytoplankton in 1942. Ecol. Monog., 15:435-457.

Clark, F. N., 1884. Report of work at the United States hatchery, Northville, Mich., 1881-82. Rept. U. S. Comm. Fish. (1881), Pt. 9:1037-1062.

Crawford, L. C., 1953. Hydrology of Lake Erie and tributaries. Lake Erie pollution survey--final report, chapt. 2:19-28. Ohio Dept. Nat. Res.

Curl, H. C., 1953. A study of distribution of phosphorus in western Lake Erie and its utilization by natural phytoplankton populations. Lake Erie pollution survey-final report. In chapt. 5:133-136. Ohio Dept. Nat. Res.

Cutler, N. S., 1929. The biological investigations of pollution in the Erie-Niagara watershed. In: A biological survey of the Erie-Niagara system. Suppl. 18th. Ann. Rept. (1928), N. Y. Cons. Dept.:134-139.

Davis, C. C., and H. B. Roney, 1953. A preliminary study of industrial pollution in the Cleveland Harbor area, Ohio. I. Physical and chemical results. Ohio Jour. Sci., 53(1):14-30.

Davis, C. C., 1953. Cleveland Harbor industrial pollution study. In: Lake Erie pollution survey--final report, chapt. 5:170-188. Ohio Dept. Nat. Res.

_____, 1954. A preliminary study of the plankton of the Cleveland Harbor area, Ohio. II. The distribution and quantity of the phytoplankton. Ecol. Monog., 24(4):321-347.

_____, 1954. A preliminary study of the plankton of the Cleveland Harbor area, Ohio. III. The zooplankton, and general ecological considerations of phytoplankton and zooplankton production. Ohio Jour. Sci., 54(6):388-408.

_____, 1955. A preliminary study of industrial pollution in the Cleveland Harbor area, Ohio. IV. Plankton and industrial pollution in Cleveland Harbor. Jour. Sewage and Indust. Wastes, 27(7):835-850.

Doan, K. H., 1942. Some meteorological and limnological conditions as factors in the abundance of certain fishes in Lake Erie. Abstracts of Doctoral Dissertations (36), Ohio St. Univ.:47-49.

_____, 1942. Some meteorological and limnological conditions as factors in the abundance of certain fishes in Lake Erie. Ecol. Monog., 12:293-314.

Donaldson, W., and R. W. Furman, 1927. Quantitative studies of phenols in water supply. Jour. Am. Water Works Assoc., 18(5):605-620.

Ellis, J. B., and E. M. Sutherland, 1951. Report of the International Joint Commission, U S. and Canada, on the pollution of boundary waters.:312 pp.

Ellms, J. W., 1922. A sanitary survey of Lake Erie made opposite Cleveland, Ohio, 1920. Jour. Am. Water Works Assoc., 9(2):186-207.

_____, 1924. Report of a sanitary survey of Lake Erie made opposite the eastern section of Cleveland for the purpose of locating a new water works intake.:22 pp. Photostat. Dept. Public Utilities, Cleveland, O.

_____, 1940. Report on sanitary surveys of the water of Lake Erie opposite the city of Cleveland and its suburbs made during the past 36 years.:16 pp. Unpubl. MS.

Ewers, L. A., 1930. The larval development of freshwater Copepoda. Ohio St. Univ., Franz Theodore Stone Lab., Contr. (3):43 pp.

Fell, G. E., 1910. The currents at the easterly end of Lake Erie and head of Niagara River: their influence on the sanitation of the city of Buffalo, N. Y. Jour. Am. Med. Assoc., 55(10):828-834.

Fish, C. J., 1929. Preliminary report on the cooperative survey of Lake Erie--season of 1928. Bull. Buffalo Soc. Nat. Sci., 14(3):1-15 (Introduction), 195-220 (Summary and conclusions).

_____, 1929. A preliminary report on the joint survey of Lake Erie. In: A biological survey of the Erie-Niagara system. Suppl. 18th. Ann. Rept. (1928), N. Y. Cons. Dept.:39-44 (Introduction, 100-106 (Summary and conclusions).

Foulk, C. W., 1925. Industrial water supplies of Ohio. Geol. Surv. Ohio, 4th. Ser., Bull. (29):406 pp.

Gacek, W. F., 1951. Mechanical analyses of sediments from southwest Lake Erie. Master's thesis, Univ. Mich.

Gallagher, T. G., 1944. A sound approach to the problem of stream pollution. Ohio Cons. Bull., 8(1):19.

Gottschall, R. Y., 1930. Preliminary report on the phytoplankton and pollution in Presque Isle Bay, Lake Erie. Proc. Pa. Acad. Sci., 4:1-11.

_____, and O. E. Jennings, 1933. Limnological studies at Erie, Pennsylvania. Trans. Am. Micr. Soc., 52(3):181-191.

Henry, A. J., 1902. Wind velocity and fluctuations of water level on Lake Erie. U. S. Dept. Agric., Weather Bur., Bull. (262):22 pp.

Hildreth, S. P., 1837. Miscellaneous observations made during a tour in May 1835, to the Falls of Cuyahoga, near Lake Erie. Am. Jour. Sci., 31:1-84.

Hutter, H. K., 1952. Eighty years of weather and climate at Toledo, Ohio. Ohio Jour. Sci., 52(2):62-75.

International Joint Commission, 1914. Progress report--in re the pollution of boundary waters--including report of the sanitary experts. Government Printing Office, Jan. 16, 1914:388 pp. Wash.

_____, 1918. Pollution of boundary waters. Report of the consulting sanitary engineer upon remedial measures. Government Printing Office, Mar. 8, 1916:159 pp. Wash.

Jackson, D. D., 1912. Report on the sanitary condition of the Cleveland water supply, on the probable effect of the proposed changes in sewage disposal, and on the various sources of typhoid fever in Cleveland. Div. Water, Cleveland.:148 pp.

Jahoda, W. J., 1950. Seasonal differences in distribution of Diaptomus (Copepoda) in western Lake Erie (Abstract). Doctorate Dissertation, Ohio St. Univ., 58:211-216.

Jennings, H. S., 1898. Trochosphaera again. Science, N. S., 8(199):551.

_____, 1901. A report of work on the Protozoa of Lake Erie, with especial reference to the laws of their movements. Bull. U. S. Bur. Fish. (1899), 19:105-114.

Jennings, O. E., 1930. A survey of the phytoplankton at Erie, Pennsylvania. Science, N. S., 71(1848):560-561.

Johnson, J. W., 1948. The characteristics of wind waves in lakes and protected bays. Trans. Am. Geophys. Union, 29(5):671-681.

Johnson, W. H., 1948. Limnological investigations of central Lake Erie. Rept. to Univ. Western Ont.

Kadel, B. C., 1917. Anemometer records on Buffalo office building compared with those secured near surface of Lake Erie. Monthly Weather Rev., 45(4):156-159.

Kellicott, D. S., 1878. Notes on the microscopic life in the Buffalo water supply. Am. Jour. Micr. and Popular Sci., 3(11):250-252.

Kindle, E. M., 1933. Erosion and sedimentation at Point Pelee. 42d. Ann. Rept., Ont. Dept. Mines, Pt. 2:1-29.

Kinney, E. C., 1953. Solar radiation at Put-in-Bay, Ohio. MS. Stone Inst. Hydrobiol.

Kirtland, J. P., 1852. Peculiarities of the climate, flora, and fauna of the south shore of Lake Erie, in the vicinity of Cleveland, Ohio. Am. Jour. Sci., 2d. Ser., 13:215-219, 293-294.

Krecker, F. H., 1931. Vertical oscillations or seiches in lakes as a factor in the aquatic environment. Ecol., 12(1):156-163.

_____, and L. Y. Lancaster, 1933. Bottom shore fauna of western Lake Erie: A population study to a depth of six feet. Ecol., 14(2):79-93.

Lamar, W., 1953. Chemical and physical quality examination. Lake Erie pollution survey-final report. Chapt. 4:81-123. Ohio Dept. Nat. Res.

Landacre, F. L., 1908. The Protozoa of Sandusky Bay and vicinity. Proc. Ohio St. Acad. Sci., 4, Pt. 10:421-472.

Langlois, T. H., 1954. The western end of Lake Erie and its ecology.:479 pp. J. W. Edwards, Publisher, Inc., Ann Arbor.

Lewis, S. J., 1906. Quality of water in the upper Ohio River basin and at Erie, Pennsylvania. U. S. Geol. Surv., Water-supply Pap. (161): 114 pp.

McLaughlin, A. J., 1911. Sewage pollution of interstate and international waters, with special reference to the spread of typhoid fever. I. Lake Erie and the Niagara River. U. S. Treasury Department, Hyg. Lab., Bull (77), Pt. 1:169 pp.

McRae, H. C., and I. P. Kane, 1918. Engineering studies. Interception and treatment of riparian sewage. Detroit and St. Clair River District (1916). App. 1. Pollution of boundary waters. Internat. Joint Comm.:23-65.

Metcalf, I. S. H., 1940. The influence of a shore community on the distribution of certain fishes in Lake Erie, with especial reference to the white bass. Doctoral dissertat. Western Reserve Univ.

_____, 1942. The attraction of fishes by disposal plant effluent in a fresh water lake. Ohio Jour. Sci., 42(5):191-197.

Meyer, B. S., and A. C. Heritage, 1941. Effect of turbidity and depth of immersion on apparent photosynthesis in Ceratophyllum demersum. Ecol., 22(1):17-22.

Michigan Water Resources Commission, 1954. Great Lakes water temperatures at municipal sources along Michigan's shoreline. Mich. Water Res. Comm.:50 pp.

Mills, H., 1882. Microscopic organisms in the Buffalo water supply and in the Niagara River. Proc. Am. Soc. Micr., 5th Ann. Meeting:165-175.

Moseley, E. L., 1903. Rainfall and the level of Lake Erie. Nat. Geog. Mag., 14:327-328.

Oberholtzer, G. R., 1911. The currents of Lake Erie; the possible cause of the contamination of the water supply of the city of Erie by sewage discharged into the harbor. Rept. to Chief U. S. Weather Bur. (Feb.).

Ohio, State of, 1902. Sixteenth annual report, for the year ending October 31, 1901. Ohio St. Bd. Health:495 pp.

Olson, F. C. W., 1952. The currents of western Lake Erie (Abstract). Doctoral Dissertation, Ohio St. Univ., 62:419-424.

Osburn, R. C., 1926. A preliminary study of the extent and distribution of sewage pollution in the west end of Lake Erie. Ohio Div. Fish and Game:6 pp. Mimeographed.

_____, 1926. Details regarding preliminary pollution survey of Lake Erie. Ohio Div. Fish and Game:14 pp. Mimeographed.

Parmenter, R., 1929. Hydrography. In: A biological survey of the Erie-Niagara system. II. A preliminary report on the joint survey of Lake Erie. Suppl. 18th. Ann. Rept. (1928), N. Y. Cons. Dept.:45-55.

_____, 1929. Hydrography of Lake Erie. In: Preliminary report on the cooperative survey of Lake Erie--season of 1928. Bull. Buffalo Soc. Nat. Sci., 14(3):25-50.

Perkins, R. G., 1911. Typhoid fever in Cleveland in relation to pollutions of Lake Erie. Cleveland Med. Jour., 10(2):81-104.

Pincus, H. J., 1953. The motion of sediment along the south shore of Lake Erie. Proc. 4th Conf. on Coastal Eng., Chicago, 1953 Council on Wave Research.

Remick, J. T., 1942. Effect of Lake Erie on the local distribution of precipitation in winter. Bull. Am. Meteorol. Soc., 23:1-4, 111-117.

Shelford, V. E., and M. W. Boesel, 1942. Bottom animal communities of the summer of 1937. Ohio Jour. Sci., 42(5):179-190.

Smith, H. M., 1898. Biological survey of Lake Erie. Science, N. S., 8(183):13-14.

_____, 1900. Report on the inquiry respecting food-fishes and the fishing-grounds. Rept. U. S. Comm. Fish. (1899), Pt. 25:CXIX-CXLVI.

_____, 1901. Report on the inquiry respecting food-fishes and the fishing-grounds. Rept. U. S. Comm. Fish. (1900), Pt. 26:119-135.

Snow, J. W., 1903. The plankton algae of Lake Erie, with special reference to the Chlorophyceae. Bull. U. S. Fish Comm. (1902), 22:369-394, 1904. Doc. (529) issued Aug. 4, 1903.

Stehle, M. E., 1923. Surface plankton Protozoa from Lake Erie in the Put-in-Bay region. Ohio Jour. Sci., 23(1):41-54.

Streeter, H. W., 1953. Bacterial and sanitary analyses. Lake Erie pollution survey--final report. Chapt. 3:29-80. Ohio Dept. Nat. Res.

Taft, C. E., 1942. Additions to the algae of the west end of Lake Erie. Ohio Jour. Sci., 42(6):251-256.

_____, 1945. The desmids of the west end of Lake Erie. Ohio Jour. Sci., 45(5)180-205.

Tidd, W. M., 1928. Zooplankton investigation in the west end of Lake Erie for the spring, summer and fall of 1928. Ohio Div. Fish and Game:3 pp. Mimeographed.

_____, 1955. The zooplankton of western Lake Erie. In: Limnological survey of western Lake Erie, by Stillman Wright. Spec. Sci. Rept.: Fish. (139), U. S. Fish and Wildlife Serv.:200-249.

Tiffany, L. H., 1929. Algae of Lake Erie in relation to pollution.:2 pp. Mimeographed.

_____, and E. H. Ahlstrom, 1931. New and interesting plankton algae from Lake Erie. Ohio Jour. Sci., 31(6):455-467.

Tiffany, L. H., 1934. The plankton algae of the west end of Lake Erie. Ohio St. Univ., Franz Theodore Stone Lab., Contr. (6):112 pp.

_____, 1937. The filamentous algae of the west end of Lake Erie. Am. Midland Nat., 18(6):911-951.

_____, 1955. The phytoplankton of western Lake Erie. In: Limnological survey of western Lake Erie, by Stillman Wright. Spec. Sci. Rept.:Fish. (139), U. S. Fish and Wildlife Serv.:139-200.

Turner, C. H., 1892. Notes on the Cladocera, Copepoda, Ostracoda, Rotifera of Cincinnati, with descriptions of new species. Bull. Sci. Lab. Denison Univ., 6(2):57-74.

U. S. Public Health Service, 1951. Lake Erie drainage basin. A cooperative state-federal report on water pollution. Water Pollution Ser. (11), U. S. P. H. Serv. Publ. (119):42 pp.

Van Gieson, P., 1942. Studies of bathing beach waters of Cleveland. Ann. Rept., Ohio Conference on Sewage Treatment, 15:39-43.

Van Oosten, J., 1929. Some fisheries problems on the Great Lakes. Trans. Amer. Fish. Soc., 59:63-85.

_____, 1948. Turbidity as a factor in the decline of Great Lakes fishes with special reference to Lake Erie. Trans. Am. Fish. Soc. (1945), 75:310-337.

Verber, J. L., 1953. Tentative summary of studies of water movements in Lake Erie. Lake Erie pollution survey--final report. Chapt. 5:136. Ohio Dept. Nat. Res.

_____, 1953. Surface water movement in western Lake Erie. Ohio Jour. Sci., 53(1):42-46.

_____, 1955. Rotational water movements in western Lake Erie. Proc. Internat. Assoc. Theoret. Appl. Limnol., 12:97-104.

_____, 1955. The climates of South Bass Island, western Lake Erie. Ecol., 36(3):388-400.

_____, 1955. Bibliography of physical limnology, 1781-1954. Rept. Invest. (25), Contr. (4) Lake Erie Geol. Res. Program, Ohio Dept. Nat. Res.:57 pp.

Verduin, J., 1950. Data for converting light penetration to turbidity in ppm. Franz Theodore Stone Inst. Hydrobiol., Put-in-Bay, Ohio. Unpubl.

_____, 1951. A comparison of phytoplankton data obtained by a mobile sampling method with those obtained from a single station. Am. Jour. Bot., 38(1) 5-11.

_____, 1951. Comparison of spring diatom crops of western Lake Erie in 1949 and 1950. Ecol., 32(4):662-668.

_____, 1952. Photosynthesis and growth rates of two diatom communities in western Lake Erie. Ecol., 33(2):163-168.

_____, 1953. The suspended silt in western Lake Erie during the spring of 1951. Lake Erie pollution survey--final report. Chapt. 5:130-133. Ohio Dept. Nat. Res.

_____, 1954. Phytoplankton and turbidity in western Lake Erie. Ecol., 35(4):550-561.

_____, 1956. Primary production in lakes. Limnol. and Oceanog., 1(2):85-91.

Vorce, C. M., 1881. Forms observed in water of Lake Erie. Proc. Am. Soc. Micr., 4:50-60.

_____, 1882. Microscopic forms observed in the waters of Lake Erie. Proc. Am. Soc. Micr., 5:187-196.

Wagner, F. E., 1929. Chemical investigation of the Erie-Niagara watershed. In: A biological survey of the Erie-Niagara system. Suppl. 18th. Ann. Rept. (1928), N. Y. Cons. Dept.:107-133.

Walton, L. B., 1915. A review of the described species of the order Euglenoidina Bloch., class Flagellata (Protozoa), with particular reference to those found in the city water supplies and in other localities of Ohio. Ohio St. Univ. Bull., 19(5), Ohio Biol. Surv. Bull., 1(4):341-457.

Weeks, O. B., and D. C. Chandler, 1945. A visual comparator for the estimation of turbidities of lake water of less than 25 ppm. Limn. Soc. Am., Spec. Publ. (17):4 pp.

Whipple, G. C., 1905. Report on the quality of the water supply of the city of Cleveland, Ohio. Div. Water Repts., Cleveland.

Whittlesey, C., 1851. On the superficial deposits of the northwestern part of the United States. Proc. Am. Assoc. Adv. Sci., 5:54-59.

Williams, R. C., 1929. Pollution studies in the light of the chemical analyses. In: Preliminary report on the cooperative survey of Lake Erie--season of 1928. Bull. Buffalo Soc. Nat. Sci., 14(3):60-64.

_____, 1929. Chemical studies of Lake Erie. In: A biological survey of the Erie-Niagara system. II. A preliminary report on the joint survey of Lake Erie. Suppl. 18th. Ann. Rept. (1928), N. Y. Cons. Dept.:58-60.

Wilson, C. B., 1929. The macroplankton of Lake Erie. In: Preliminary report on the cooperative survey of Lake Erie--season of 1928. Bull. Buffalo Soc. Nat. Sci., 14(3):94-135.

_____, 1929. The macroplankton of Lake Erie. In: A biological survey of the Erie-Niagara system. II. A preliminary report on the joint survey of Lake Erie. Suppl. 18th. Ann. Rept. (1928), N. Y. Cons. Dept.:67-76.

Wood, H. A. H., 1951. Erosion on the shore of Lake Erie--Point aux Pins to Long Point. Master's thesis. McMaster Univ.

Wood, K. G., 1953. Polarograms of oxygen in lake water. Science, 117:560-561.

_____, 1953. Distribution and ecology of certain bottom living invertebrates of the western basin of Lake Erie (Abstract). Doctorate Dissertation, Ohio St. Univ., 72.

Wright, S., 1931. Bottom temperatures in deep lakes. Science, N. S., 74(1921):413.

_____, 1932. Pollution in western Lake Erie. The Fisherman, 1(6):3-4, 10.

_____, and W. M. Tidd, 1933. Summary of limnological investigations in western Lake Erie in 1929 and 1930. Trans. Am. Fish. Soc., 63:271-285.

Wright, S., 1955. Limnological survey of western Lake Erie. Spec. Sci. Rept.:Fish. (139), U. S. Fish and Wildlife Serv.:341 pp.

Young, M. K., 1928. Report on chemical investigations of the cooperative biological survey of 1927 and 1928. Ohio Div. Fish and Game:10 pp. Mimeographed.

Youngquist, C. V., 1953. Lake Erie pollution survey--final report. Introduction. Chapt. 1:13-18. Ohio Dept. Nat. Res.

_____, 1953. Lake Erie pollution survey--supplement. Ohio Dept. Nat. Res.:125 pp.

Zillig, A. M., 1929. Bacteriological studies of Lake Erie. In: Preliminary report on the cooperative survey of Lake Erie--season of 1928. Bull. Buffalo Soc. Nat. Sci., 14(3):51-59.

_____, 1929. Bacterial studies of Lake Erie. In: A biological survey of the Erie-Niagara system. II. A preliminary report on the joint survey of Lake Erie. Suppl. 18th. Ann. Rept. (1928), N. Y. Cons. Dept.: 56-58.

Lake Ontario

Adamstone, F. B., 1924. The distribution and economic importance of the bottom fauna of Lake Nipigon with an appendix on the bottom fauna of Lake Ontario. Univ. Toronto Studies, Biol. Ser., Publ. Ont. Fish. Res. Lab. (24):33-100.

Clark, L. J., 1892. Lake currents. Trans Roy. Can. Inst. (1890-1891, 2:154-157, 1892.

_____, 1893. Lake currents. Trans. Roy. Can. Inst. (1891-1892), 3:275-280, 1893.

Dewey, C., 1838. Temperature of Lake Ontario. Am. Jour. Sci., 33:403-405.

_____, 1839. On the temperature of Lake Ontario. Am. Jour. Sci., 37:242-243.

_____, 1859. Varying level of Lake Ontario. Am. Jour. Sci., 2d. Ser., 27:398-399.

Drummond, A. T., 1889. Some Lake Ontario temperatures. Nature, 40:416. London.

Faigenbaum, H. M., 1932. Chemical investigation of the Oswegatchie and Black river watersheds. In: A biological survey of the Oswegatchie and Black river systems (Including also the lesser tributary streams of the Upper St. Lawrence River and of northeastern Lake Ontario). Biol. Surv. (1931), (6), Suppl. 21st. Ann. Rept. (1931), N. Y. Cons. Dept.:150-188.

Farrell, M. A., 1932. Pollution studies. In: A biological survey of the Oswegatchie and Black river systems (Including also the lesser tributary

streams of the Upper St. Lawrence River and of Northeastern Lake Ontario). Biol. Surv. (1931), (6), Suppl. 21st. Ann. Rept. (1931), N. Y. Cons. Dept.:189-198.

Goodwin, W. L., 1892. The water supply of the city of Kingston, Ontario. Can. Rec. Sci., 5(2):117-127.

Kindle, E. M., 1915. Note on bottom currents in Lake Ontario. Am. Jour. Sci., 4th. Ser., 39:192-196.

_____, 1915. Limestone solution on the bottom of Lake Ontario. Am. Jour. Sci., 4th. Ser., 39(234):651-656.

Langford, R. R., 1946. The study of seasonal and annual plankton production in the eastern end of Lake Ontario. Proc. 9th. Meet. Nation. Comm. Fish Cult., App. "D".

M'Anslan, W., 1888. On the temperature of Lake Ontario. Am. Jour. Sci., 33:403.

McLaughlin, A. J., 1912. Sewage pollution of interstate and international waters, with special reference to the spread of typhoid fever. II. Lake Superior and St. Marys River. III. Lake Michigan and the Straits of Mackinac. IV. Lake Huron, St. Clair River, Lake St. Clair, and the Detroit River. V. Lake Ontario and St. Lawrence River. U. S. Treasury Dept., Hyg. Lab., Bull. (83):296 pp.

Sibley, C. K., 1932. Fish food studies. In: A biological survey of the Oswegatchie and Black river systems (Including also the lesser tributary streams of the Upper St. Lawrence River and of northeastern Lake Ontario). Biol. Surv. (1931), (6), Suppl. 21st. Ann. Rept. (1931), N. Y. Cons. Dept.:120-132.

Tressler, W. L., T. S. Austin, and E. Orban, 1953. Seasonal variation of some limnological factors in Irondequoit Bay, New York. Am. Midland Nat., 49:878-903.

Tucker, A., 1948. The phytoplankton of the Bay of Quinte. Trans. Am. Micr. Soc., 67(4):365-383.

Whipple, G. C., 1913. Effect of the sewage of Rochester, N. Y. on the Genesee River and Lake Ontario under present conditions. In: Report on the sewage disposal system of Rochester, New York, by Edwin A. Fisher, App. 5:177-239.

All Great Lakes

Abbe, C., 1898. The rainfall and outflow of the Great Lakes. Monthly Weather Rev., 26(4):164-166.

_____, 1898. Temperature of lake water. Monthly Weather Rev., 26(5):167.

Blackwell, T. E., 1869. On the hydrology of the basin of the River Saint Lawrence. Trans. Am. Phil. Soc., 13, Pt. 3:249-304.

Brater, E. F., 1953. Hydrology and meteorology section. In: Rept. Conf. Upper Great Lakes by Fred K. Sparrow:7-11.

Clarke, F. W., 1924. The composition of the river and lake waters of the United States. Prof. Pap.(135), U. S. Geol. Surv.:199 pp.

Conger, N. B., 1899. Water temperature of the Great Lakes. Monthly Weather Rev. (8):352.

_____, 1908. Ice conditions on the Great Lakes, winter of 1907-08. Monthly Weather Rev. and Ann. Summary, 36(1):137-140.

_____, 1908. Storms and ice on the Great Lakes. Monthly Weather Rev., 36(8):236-244.

_____, 1909. Ice conditions on the Great Lakes, winter of 1908-09. Monthly Weather Rev., 37(6):244-246.

Day, P. C., 1927. Precipitation in the drainage area of the Great Lakes, 1875-1924, with discussion of the levels of the separate lakes and their relation to the annual precipitation. U. S. Weather Bur., Monthly Weather Rev. (1926), 54(3):85-106.

Dewey, D., 1846. Facts relating to the Great Lakes. Am. Jour. Sci., 2d. Ser., 2:85-87. Also in: Edinb. New Phil. Jour., 17:295, 1847.

Dole, R. B., 1908. The waters of the Great Lakes. Paper presented before Am. Public Health Assoc., Winnipeg, Manitoba, August, 1908.

_____, 1909. The quality of surface waters in the United States. Pt. 1. Analyses of waters east of the one hundredth meridian. U. S. Geol. Surv., Water-supply Pap. (236):123 pp.

Drummond, A. T., 1890. Some temperatures in the Great Lakes and St. Lawrence. Can. Rec. Sci., 4(2):77-85.

_____, 1892. Some lake and river temperatures. Can. Rec. Sci., 5(1):13-19.

Eshleman, C. H., 1921. Do the Great Lakes diminish rainfall in the crop growing season? U. S. Weather Bur., Monthly Weather Rev., 49(9):5000-503.

Garriott, E. B., 1903. Storms of the Great Lakes. U. S. Dept. Agric., Weather Bur. (288), Bull. K.

Gaylord, W., 1938. Influence of the Great Lakes on our autumnal sunsets. Am. Jour. Sci., 33:335-341.

Hachey, H. B., 1952. Vertical temperature distribution in the Great Lakes. Jour. Fish. Res. Bd. Can., 9(7):325-328.

Harrington, M. W., 1894. Currents of the Great Lakes as deduced from the movements of bottle papers during the seasons of 1892 and 1893. U. S. Dept. Agric., Weather Bur., Bull. B:6 pp.

_____, 1895. Surface currents of the Great Lakes, as deduced from the movements of bottle papers during the seasons of 1892, 1893, and 1894. U. S. Dept. Agric., Weather Bur., Bull. B. (rev. edit.):1-14.

Henry, A. J., 1899. Normal precipitation in the region of the Great Lakes. Monthly Weather Rev., 27(4):151-153.

_____, 1900. Lake levels and wind phenomena. Monthly Weather Rev., 28(5):203-205.

_____, 1905. High water in the Great Lakes. Monthly Weather Rev., 33(2):47-49.

_____, and N. B. Conger, 1905. Meteorological chart of the Great Lakes. U. S. Dept. Agric., Weather Bur., (333), (1):19 pp.

Hickman, H. C., 1940. Evaporation experiments. Hydrology of the Great Lakes--a symposium. Trans. Am. Soc. Civil Engrs., 105(2074): 807-818.

Higgins, 1930. Rept. U. S. Comm. Fish. for 1929, pp. 710-718.

Horton, R. E., and C. E. Grunsky, 1927. Hydrology of the Great Lakes. Report of the Engineering Board of Review of the Sanitary District of Chicago on the lake lowering controversy and a program of remedial measures. Pt. 3, App. 2:432 pp.

Leighly, J. E., 1941. Effects of the Great Lakes on the annual march of air temperatures in their vicinity. Pap. Mich. Acad. Sci. Arts. Lett., 27:377-414.

Lenhardt, L. G., 1955. Water quality and water usage of the Great Lakes public water supplies. The Great Lakes and Michigan. Great Lakes Res. Inst., Univ. Mich.:13-15.

Millar, F. G., 1952. Surface temperatures of the Great Lakes. Jour. Fish. Res. Bd. Can., 9(7):329-376.

Nasmith, G. G., and F. Adams, 1914. Wind driven currents in the Great Lakes and their effect on municipal water supply. Jour. Preventive Medicine and Sociology, 16(6):246-253.

Pettis, C. R., 1939. Hydrology of the Great Lakes. Trans. Am. Soc. Civil Engrs, 104:584-596.

_____, H. C. Hickman, et al, 1940. Hydrology of the Great Lakes--A symposium. Trans. Am. Soc. Civil Engrs., 105(2074):794-849.

Poore, C., and L. E. Cooley, 1897. The ice season--Basin of the Great Lakes and surrounding territory. Rept. U. S. Deep Waterways Comm. (1896), House Representatives, 54th. Congr., 2d. Sess., Doc.(192):193-263.

Russell, I. C., 1895. Lakes of North America.:125 pp. Ginn and Co.

Schermerhorn, L. Y., 1887. Physical characteristics of the northern and northwestern lakes. Am. Jour. Sci., 3d. Ser., 33(196):278-284.

Smith, S. H., 1957. Limnological surveys of the Great Lakes--early and recent. Trans. Am. Fish. Soc. (1956), 86:409-418.

Streeter, H. W., 1930. Studies of the efficiency of water purification processes. IV. Report on a collective survey of the efficiency of a selected group of municipal water purification plants located along the Great Lakes. U. S. Public Health Bull. (193):100 pp.

Visher, S. S., 1943. Some climatic influences of the Great Lakes. Bull. Am. Metecrol. Soc., 24:205-210.

Wisner, G. Y., 1898. The rainfall and outflow of the Great Lakes. Monthly Weather Rev., 26(5):215-216.

Zacharias, O., 1894. Biologische Untersuchungen in amerikanischen Seen. Biologisches Centralblatt, 14:605-6-7.

ADDITIONAL BIBLIOGRAPHY

Anonymous, 1956. A study of organic contaminants in boundary waters using carbon filter techniques. Lake Huron-Lake Erie, 1953-1955. Prepared for the Inter. Joint Comm., U. S. and Canada, by U. S. Dept. Health, Ed., and Welfare, Public Health Serv.; Robert A. Taft Sanitary Engin. Center, Cincinnati, Ohio, and Ont. Dept. Health, Toronto, Ontario.

_____, 1954. Public Water Supply Data, Bulletin No. 19, Bureau of Environmental Sanitation, New York State Dept. of Health, Albany, N. Y.

Gillies, D. K. A., 1955. Meteorological factors affecting Lake Erie: A progress report. Hydro-Electric Power Comm. Ont., Res. Div. Rpt., File 819.514, mimeographed.

Hunt, M. I. A., 1958. Evaporation of Lake Ontario. U. S. Lake Survey, Corps of Engineers. Paper presented Amer. Soc. Civil Engrs., Chicago, 25 Feb.

Ingram, W. M., 1957, Rev. Handbook of Selected Biological References on Water Pollution Control, Sewage Treatment, Water Treatment. U. S. Dept. Health, Ed., and Welfare, Public Health Serv., Bur. State Services, Water Supply and Water Pollution Control Program, Washington 25, D. C.

_____, 1956. Handbook of Selected Biological References (Supplement) on Water Pollution Control, Sewage Treatment, Water Treatment. Water Pollution Control, Water Supply and Water Pollution Control Program, Robert A. Taft Sanitary Eng. Center, U. S. Dept. Health, Ed., and Welfare, Public Health Service, Cincinnati, Ohio., mimeographed.

Ropes, G. E., 1954. Precipitation over northeastern Lake Michigan (November 1952-October 1953). U. S. Lake Survey, Corps of Engrs., U. S. Army, 630 Federal Bldg., Detroit, Mich., mimeographed.

Thomas, J. F. J., 1954. Industrial Water Resources of Canada, Water Survey Report No. 3. Upper St. Lawrence River-Central Lakes Drainage Basin in Canada. Canada Dept. Mines and Techn. Surveys, Mines Branch, Indust. Miner. Div., Ottawa, Ont.

Thoman, J. R. Statistical Summary of Sewage Works in the United States. Supplement 213, Public Health Reports, Federal Security Agency, Public Health Service, Washington 25, D. C.

APPENDIX II

INDEX AND PERIOD OF RECORD FOR METEOROLOGICAL STATIONS IN ONTARIO

JULY 1958

This appendix contains listings of all Ontario stations that make observations of the following meteorological elements:

1. Wind
2. Sunshine
3. Temperature
4. Precipitation

This index should be used as a supplement to the information on Ontario stations given in tables 1 and 2. There are many more stations reported here than are listed for Ontario in the two tables, because the tables were prepared to show only stations within the Great Lakes Drainage Basin. In this regard, the symbols OS, DB, DB*, and Out are used in the Notes column of the Appendix. These indicate into which classification the stations should be placed according to whether they are, respectfully, onshore stations, stations greater than two miles inland from the shore but within the Drainage Basin, within a few miles of the Drainage Basin boundary but geographically outside, or completely outside the Basin.

The parenthetical suffixes following the station listing indicate the type of observational facility, A for airport, R for radio range, etc. The notation A under the Active 1958 column heading indicates the station so marked was in operation at the time the index was compiled.

Explanatory prefaces to each of the sections of the Index are included as prepared by the Climatological Section of the Canadian Meteorological Division. Grateful acknowledgment is herewith tendered to that office for its cooperation and assistance.

Index of Wind Reporting Stations in the Province of Ontario

1. Stations: This index contains a list of all the stations in the Province of Ontario which have reported autographic wind data since January 1922. Since January 1955, stations without autographic wind equipment, but which record hourly observations of wind as part of the aviation weather reports, have been included. Most of the stations will have fairly continous homogeneous records over the period of years involved, but at some the position of the anemometer may have been changed one or more times. For practical purposes, we have considered each station record as homogeneous.

2. Location: Precise location of each station is given in the January issues of the Monthly Record. In the list that follows, the county in which each observation station is located has been listed. Where stations have had different names, or where the period of record does not extend over the whole year, such facts are noted at the right hand side of the index.

3. Period of Record: The first month where data are available in the Meteorological Headquarters abstracts is shown as the date on which the station was opened. Similarly, the last month of record from the abstract is shown as the closed date. Stations in operation in July 1958 have been so marked in the proper column. When a station has appreciable break in the records, this fact has been noted.

4. Data: Percentage frequencies of wind direction and mean wind speed are shown for most of these stations in Climatic Summaries Volume II. From 1922 to 1954 the data have been abstracted from anemograms obtained from anemometers of the Robinson cup type. At the beginning of the period the four-cup anemometer was used, but during the early 1930's these were replaced by the three-cup anemometer. The anemograms record the number of miles of wind in each hour along with prevailing direction. Since January 1955, at those stations where hourly observations of the wind speed and direction are taken and recorded, these data have been processed instead of anemogram data. For practical purposes, data from the two sources should be considered as being the

same. At each observing station the anemometer is placed in the most representative location possible and an attempt is made to place the anemometer head thirty feet above the surface of the ground. A more complete discussion of wind data is to be found in the wind text of Climatic Summaries Volume II, Canadian Meteorological Division.

WIND RECORDS

Station	County or District	Open	Closed	Active 1958	Notes
Agincourt	York	Jan 1922	Dec 1945		DB
		Jan 1950		A	
Armstrong (A)	Thunder Bay	Aug 1938		A	Wagaming; DB
Camp Borden (A)	Simcoe	Jan 1940	Oct 1945		DB
Caribou Island	Thunder Bay	Apr 1942		A	Summer station; OS
Centralia (A)	Huron	Aug 1950		A	DB
Chalk River	Renfrew	Sept 1931		A	DB
Clear Creek (R)	Norfolk	Jan 1955		A	OS
Cobourg	Northumberland	Jan 1926	Apr 1950		OS
Cochrane	Cochrane	Jan 1924	Dec 1938		Out
Earlton (A)	Timiskaming	Oct 1938		A	DB
Fergus	Wellington	Mar 1955		A	DB
Fort William (A)	Thunder Bay	Sept 1941		A	Lakehead Airport; OS
Fullarton	Perth	Jan 1958		A	DB
Gore Bay (A)	Manitoulin	Aug 1948		A	OS
Graham (A)	Thunder Bay	June 1951		A	DB
Guelph	Wellington	Jan 1922		A	DB
Haileybury	Timiskaming	Nov 1931	Dec 1952		Out
Hamilton (Marine)	Wentworth	Nov 1953		A	OS
Hamilton (R.B.G.)	Wentworth	July 1951		A	OS
Kapuskasing (A)	Cochrane	June 1938		A	Out
Kenora (A)	Kenora	Feb 1923		A	Out
Killaloe (A)	Renfrew	Sept 1938		A	DB
Kingston	Frontenac	Jan 1922	June 1942		OS
Lansdowne House	Patricia	Jan 1957		A	Out
London (A)	Middlesex	Aug 1940		A	DB
London (Lambeth)	Middlesex	Mar 1931	July 1940		DB
Long Point	Norfolk	Apr 1922	Dec 1954		Summer station; OS
Main Duck Island	Prince Edward	May 1944	Nov 1954		Summer station; OS
Maitland	Grenville	Dec 1952	June 1953		OS
Malton (A)	York	Nov 1937		A	Toronto Malton Airport; DB
Moosonee	Cochrane	Jan 1938	Mar 1939		
		Feb 1943		A	Out
Muskoka (A)	Muskoka	Aug 1938		A	DB
Nakina (A)	Thunder Bay	May 1939		A	DB
North Bay (A)	Nipissing	Jan 1939		A	DB
Oak Ridges	York	Jan 1922	Sept 1941		Aurora; DB
Ottawa (A)	Carleton	Nov 1939		A	Ottawa Uplands Airport; DB*
Ottawa (Exp. Farm)	Carleton	May 1934	Dec 1940		Out
Ottawa (N.R.C.)	Carleton	Dec 1951		A	Out
Pagwa (A)	Cochrane	Nov 1938		A	DB*

Station	County or District	Open	Close	Active 1958	Notes
Parry Sound	Parry Sound	Jan 1922	Dec 1949		OS
Pickle Lake	Patricia	Nov 1955		A	Out
Porquis Junction (A)	Cochrane	Jan 1939	Mar 1955	A	Out
Port Arthur	Thunder Bay	Jan 1922	July 1941		OS
Rockcliffe (A)	Carleton	Aug 1950		A	Ottawa Rockcliffe Airport; DB*
St. Catharines (P. Lab.)	Lincoln	July 1952		A	DB
Sarnia (R)	Lambton	Sept 1948	June 1951		OS
Sioux Lookout (A)	Kenora	Jan 1936	June 1950		Out
		Jan 1955			
Southampton	Bruce	Jan 1922	Dec 1945		
		Nov 1951	Nov 1952		
		Dec 1954		A	Broken from 1955 on; OS
South Bay Mouth	Manitoulin	July 1954		A	OS
Stirling (R)	Hastings	Mar 1940		A	DB
Sudbury (A)	Sudbury	Jan 1954		A	DB
Sudbury	Sudbury	Oct 1947	Jan 1955		DB
Timmins (A)	Cochrane	Apr 1955		A	Out
Toronto	York	Jan 1922		A	OS
Toronto (Downsview) (A)	York	Oct 1956		A	DB
Trenton (A)	Hastings	Apr 1941	Dec 1941		
		Jan 1947		A	OS
Trout Lake	Patricia	July 1953		A	Out
Vineland	Lincoln	Apr 1932	Feb 1958		DB
White River	Algoma	Jan 1922		A	DB
Wiarton (A)	Bruce	Jan 1955		A	OS
Windsor (A)	Essex	Sept 1940		A	DB

Index of Bright Sunshine Reporting Stations in the Province of Ontario

1. Stations: This index is a list of all the stations in the Province of Ontario which have reported bright sunshine data since 1881. While there have been relocations of some of the stations, for practical purposes, all the data for each station should be considered as homogeneous.

2. Location: The precise location of each station in this index is shown in the January issue of the Monthly Record during many of the years of record for each station. Alternate station names and whether or not the record is complete for the year as a whole is shown on the right hand side of the index.

3. Period of Record: The first month where data are available in Meteorological Headquarters abstracts is shown as the date on which the station opened. Similarly, the last month of record in the abstract is shown as the closed date. Where stations were in operation in July 1958 the symbol A has been shown in the proper column.

4. Bright Sunshine Data: In Canada, bright sunshine is recorded on a Campbell-Stokes recorder. By means of a glass sphere, sunshine is focused to produce a burn on a narrow sunshine chart from which the observer is able to scale off the number of hours a day on which a bright sun was shining. These daily totals, which are scaled off to a tenth of an hour, are added to give the monthly total of bright sunshine in hours. The recorder, which is usually placed on a stand, is mounted free from all obstructions from horizon to horizon so that no shadows will fall across

the recorder in any season. Attention should be given to the fact that the Canadian bright sunshine values differ from the U.S.W.B. values of visible sunshine. Visible sunshine values are usually considerably higher than bright sunshine values since the sunshine will not register on a Campbell-Stokes recorder when there is a thin layer of high cloud or in the intervals about one half an hour after sunrise and before sunset.

SUNSHINE RECORDS

Station	County or District	Open	Close	Active 1958	Notes
Armstrong (A)	Thunder Bay	Aug 1938		A	Wagaming; DB
Barrie	Simcoe	Dec 1882	Aug 1903		
		Sept 1905	Dec 1931		DB
Belleville (Par. Lab.)	Hastings	Sept 1929	Apr 1953		OS
Brampton	Peel	July 1950		A	DB
Caribou Island	Thunder Bay	May 1944		A	Summer station; OS
Chalk River	Renfrew	Sept 1931		A	DB
Chatham	Kent	Oct 1933		A	DB
Combermere	Renfrew	Feb 1957		A	Out
Cornwall	Stormont	Sept 1882	Dec 1887		Out
Cornwall (O. Hydro.)	Stormont	Mar 1957		A	Out
Delhi	Norfolk	Nov 1934		A	DB
Durham	Grey	Oct 1897	July 1901		DB
Fullarton	Perth	Nov 1957		A	DB
Gravenhurst	Muskoka	May 1902	Nov 1908		
		Feb 1915	May 1922		DB
Guelph	Wellington	Oct 1914		A	DB
Haileybury	Timiskaming	June 1906	Aug 1922		Out
Harrow	Essex	May 1918		A	DB
Hearst	Cochrane	Jan 1931	Mar 1931		Out
Kapuskasing	Cochrane	May 1918		A	Experimental Farm; Out
Kingston	Frontenac	Oct 1882		A	OS
Kingsville	Essex	Oct 1890	Sept 1892		OS
Kohler	Haldimand	June 1949		A	DB
Lindsay	Victoria	Aug 1882		A	DB
London (Lambeth)	Middlesex	Nov 1935	July 1941		DB
London (A)	Middlesex	Aug 1942		A	DB
Maitland	Grenville	June 1953	Apr 1954		OS
Moosonee	Cochrane	Oct 1932		A	Out
New Liskeard	Timiskaming	Jan 1924	Apr 1933		
		May 1935	Feb 1937		
		July 1943		A	Out
Oak Ridges	York	Mar 1920	Nov 1957		Aurora; DB
Ottawa (City)	Carleton	Jan 1916	Dec 1919		DB*
Ottawa (Exp. Farm)	Carleton	Jan 1898		A	DB*
Pembroke	Renfrew	May 1883	May 1888		Out
St. Catharines	Lincoln	Aug 1882	Dec 1884		DB
St. Catharines (P. Lab.)	Lincoln	Nov 1928		A	DB

Station	County or District	Open	Close	Active 1958	Notes
Stratford	Perth	Sept 1882	June 1888		DB
Sudbury	Sudbury	Nov 1944	Dec 1946		DB
Toronto	York	Aug 1881		A	OS
Turbine	Sudbury	Jan 1921		A	High Falls; DB
Vineland	Lincoln	Feb 1915		A	DB
Walker's Point	Muskoka	Nov 1928	Nov 1934		DB
Windsor	Essex	Sept 1882	Dec 1887		OS
Woodstock	Oxford	Nov 1881		A	DB

Index of Temperature and Precipitation Reporting Stations in the Province of Ontario

1. Stations: This index contains the names of all the stations in the Province of Ontario which have reported temperature and precipitation data for a period of six months or longer. Where two or more names have been used for a station, the other names are shown in the remarks column. In most cases the most recent official station name is used, but in some instances where there is more than one station at a city or town, a differentiation is made in the station name to point out the different sites of the observation stations. However, usually no indication is given whether or not the station location has been changed over the period of record. While some stations will have continuous homogeneous records over a long period of years, other stations have been moved frequently with the result that the data may not be strictly homogeneous.

2. County: Location of each station listed is restricted to the name of the county or district in which the station lies. Complete location information in the form of latitude and longitude coordinates and heights above sea level are given in the January issues of the Monthly Record. These indexes are available from 1916 to 1955 except for the even numbered years during the decade of the 1940's. For stations in operation prior to 1916 an index with coordinates is shown in each issue of the Annual Report of the Meteorological Service of Canada.

3. Period of Record: The first month where data are available in the Meteorological Headquarters abstracts is shown as the date on which the station opened. Similarly, the last month of record in the abstract is shown as the closed date. Where stations are in operation in July 1958, the symbol A has been shown in the proper column. Breaks in the record of less than six months have not been indicated. However, where there are breaks of more than six months but less than a year, this fact has been entered in the remarks column. When the break is more than a year, the period of record is shown in two segments.

4. Temperature: The temperature data referred to have been obtained from temperature observations read from official thermometers in standard shelters. These shelters protect thermometers against radiation and weather and during the early part of the period were located on a north wall. However, for the past several decades at each station the thermometers have been housed in a Stevenson screen over a relatively level grassy surface with the bulbs of the thermometers about four feet above the surface of the ground.

5. Precipitation: Precipitation data consists of rainfall data taken from official raingauge observations and snowfall data which are observed as the snow lies on the ground. The top of the raingauge is usually located one foot above a level grassy surface. In reducing snowfall data to the water equivalent, a ten to one arbitrary relationship is assumed, that is, the equivalent of ten inches of snow is taken to be one inch of water.

6. Classification of Station: All stations should be considered as having both temperature extremes and precipitation data except those marked with a capital P in the proper column. Sometimes a station started as a "precipitation only" station and then at a later date became a temperature reporting station. This fact is noted in the remarks column. Further information on "summer only" stations and other notes of value to the user of the data will be found in this column. For explanation of the symbols OS, DB, DB*, and Out, see the introductory remarks on page 160.

TEMPERATURE AND PRECIPITATION RECORDS

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Abitibi Canyon	Cochrane	Jan 1931		A		Out
Agincourt	York	Jan 1896		A		DB
Aguasabon	Thunder Bay	June 1950		A		Out
Ailsa Craig	Middlesex	Jan 1871	June 1873			
		Jan 1883	Apr 1888			DB
Albany	Patricia	June 1934	May 1939			Broken record; Out
Albion	Peel	Apr 1956		A	P	DB
Aldershot	Halton	Feb 1947		A	P	DB
Aldershot (O. Hydro.)	Halton	Apr 1951		A		Burlington T.S.; DB
Alexandria	Glengarry	July 1888	Dec 1893			Out
Algonquin Park	Nipissing	July 1917		A		DB
Alliston	Simcoe	Mar 1953		A	P	DB
Alloa	Peel	Nov 1950	Nov 1954			Broken record; DB
Almonte	Lanark	Feb 1912	Apr 1922			
		Sept 1948	Nov 1949			Out
Alton	Peel	Jan 1887		A		Data doubtful since 1936; DB
Amherstburg	Essex	June 1883	July 1884		P	OS
Angus	Simcoe	Jan 1930		A		DB
Apple Hill	Glengarry	Nov 1950		A		Out
Apsley	Peterborough	Mar 1922	Dec 1940			
		Dec 1944	Mar 1957			Broken record; DB
Arden	Frontenac	Jan 1895	Jan 1911			DB
Armstrong (A)	Thunder Bay	Aug 1938		A	P	Wagaming; DB
Armstrong	Thunder Bay	May 1926	Oct 1947			Summer station 1939-1947; DB
Atikokan	Rainy River	Feb 1916	Oct 1916			
		Feb 1918		A		DB
Augusta	Grenville	Jan 1883	July 1883		P	DB
Aurora	York	May 1884	Apr 1919			DB
Axe Lake	Parry Sound	Feb 1885	Dec 1898		P	Broken record (Spence); DB
Aylmer	Elgin	Sept 1883	May 1888			
		May 1948	June 1956			
		June 1957		A	P	Out
Aylmer (2)	Elgin	June 1958		A		Out
Ayr	Waterloo	Apr 1956		A		DB
Bala	Muskoka	July 1883	Dec 1907			Whiteside; DB
Bancroft	Hastings	Jan 1884	Mar 1886			
		Oct 1889	Dec 1900			
		Jan 1905	Sept 1945			
		Dec 1946	Dec 1947			
		Apr 1949	Dec 1955			DB*
Barclay	Kenora	Apr 1887	Dec 1890		P	
		Apr 1894	Nov 1896			DB
Bark Lake Dam	Renfrew	Jan 1950		A		DB*
Barrett Chute	Renfrew	May 1950		A	P	Out
Barrie	Simcoe	Mar 1866	Dec 1901			Broken record
		Jan 1907	Dec 1921			
		Sept 1923	Feb 1924			
		Jan 1927	July 1936			
		June 1950		A		DB
Bear Island	Nipissing	May 1916	Jan 1917			Beards -
		Aug 1918	July 1949			Broken record; DB
		June 1950		A		
Beatrice	Muskoka	Mar 1876		A		Rosehill; DB

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Beaverton	Ontario	Mar 1948	June 1949			
		Jan 1951		A		Broken record; DB
Beeton	Simcoe	Nov 1916		A		DB
Beggsboro	Parry Sound	June 1884	Feb 1901			Sprucedale; DB
Bell Rock	Frontenac	May 1957		A	P	to T and P; DB
Belleville	Hastings	Jan 1866	May 1878			
		May 1883	Sept 1890			
		Jan 1892	Apr 1904			
		Jan 1921		A		OS
Belleville (Par. Lab.)	Hastings	Aug 1929		A		OS
Benny	Sudbury	Nov 1948	Oct 1956		P	Espanola; DB
Big Chaudiere Falls	Parry Sound	May 1918	Nov 1919			
		Jan 1921	Dec 1930		P	DB
Big Chute	Muskoka	May 1913	May 1916			
(Buckskin)		May 1920	Feb 1924			Broken record
		Dec 1956		A	P	DB
Bingham Chute	Parry Sound	Feb 1933		A		DB
Birnam	Lambton	Oct 1882	Mar 1915			Arkona broken; DB
Biscotasing	Sudbury	Oct 1887	Apr 1889			
		June 1890	July 1891			
		Jan 1895	July 1896			
		Jan 1900	Dec 1900			
		Dec 1926		A		DB
Black Sturgeon Lake	Thunder Bay	May 1951	Aug 1954			Summer station; DB
Black Sturgeon River	Thunder Bay	Oct 1957		A		DB
Blenheim	Kent	Apr 1883	Dec 1897		P	DB
Blind River	Algoma	Apr 1926	Dec 1940			
		July 1956	Oct 1957			Broken record; OS
Bloomfield	Prince Edward	Apr 1896	June 1903			
		Feb 1906	Dec 1933			OS
Bobcaygen	Victoria	May 1883	May 1897		P	DB
Bognor	Grey	May 1883	Sept 1900			Bond Head; DB
Bowmanville	Durham	Aug 1947	Dec 1957			OS
Bow Park (Brantford)	Brant	Oct 1912	Dec 1913			DB
Bracebridge	Muskoka	Sept 1882	Mar 1886		P	DB
Bradford	Simcoe	Sept 1951	June 1957		P	in 1957; DB
Bradford (2)	Simcoe	Aug 1954		A		DB
Brampton	Peel	Jan 1871	Dec 1888			DB
		May 1948		A		DB
Brantford	Brant	Jan 1876	May 1878			
		Apr 1881	Aug 1915			
		Jan 1917	Dec 1920			
		Jan 1922	May 1930			
		Jan 1931	Jan 1957			Broken record
		Mar 1958		A		DB
Brechin	Simcoe	Jan 1883	Oct 1883		P	DB
Brighton	Northumberland	May 1948	Aug 1950			OS
Brockville	Leeds	Nov 1871	June 1879			
		Jan 1889	Apr 1890			
		July 1915		A		DB
Broddytown	Peel	July 1951	Aug 1956			DB
Brucefield	Huron	Apr 1903		A		Clinton; DB
Bruce Mines	Algoma	Sept 1898	Dec 1914			OS
Brule Lake	Nipissing	May 1926	Aug 1933		P	DB
Buda	Thunder Bay	Jan 1887	June 1887			
		June 1890	Dec 1892			DB
Burleigh	Peterborough	June 1883	Nov 1887		P	DB
Burlington	Halton	Apr 1947	May 1950			
		Mar 1951		A		OS

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Burnamthorpe	Peel	May 1951	Mar 1955		P	DB
Calabogie	Renfrew	Jan 1950	Mar 1956		P	Out
Caledonia	Haldimand	Jan 1931		A		DB
Calvin	Nipissing	Apr 1895	Dec 1922			Out
Cameron Falls	Thunder Bay	June 1924		A		Broken record; DB
Campbellcroft	Durham	May 1948	Sept 1950		P	Summer station; DB
Campbellford	Northumberland	July 1915		A		DB
Campbellford (2)	Northumberland	Feb 1929	Nov 1937		P	Healey Falls; DB
Camp Borden (A)	Simcoe	Sept 1926	Feb 1928			
		May 1934	Oct 1945			DB
Canboro	Haldimand	Sept 1946		A		DB
Cannington	Ontario	May 1883	Nov 1885			
		Jan 1889	June 1890		P	DB
Capreol	Sudbury	Mar 1916	Dec 1920		P	DB
Caramat	Thunder Bay	May 1949	Aug 1957			DB
Caribou Island	Thunder Bay	May 1935		A		Summer station; OS
Caribou Lake	Thunder Bay	Aug 1930	Sept 1936		P	Summer station; DB
Carleton Place	Lanark	Aug 1948		A	P	Out
Cartier	Sudbury	Jan 1887	July 1901			Broken record
		Oct 1945	Apr 1948			DB
Cayuga	Haldimand	Apr 1885	Sept 1887		P	Broken record
		Apr 1889	June 1890			
		Jan 1892	July 1903			DB
Centralia (A)	Huron	Oct 1942		A		DB
Central Patricia	Patricia	Aug 1953		A		Out
Chalk River	Renfrew	Sept 1931		A		DB
Chapleau	Sudbury	Aug 1889	Feb 1891			
		July 1913		A		DB
Charlinch	Muskoka	Aug 1883	Dec 1892			Hoodstown; DB
Chatham	Kent	Apr 1883	Sept 1946			DB
Chatham (CFCO)	Kent	Oct 1946		A		DB
Chats Falls	Carleton	June 1950		A		Out
Chatsworth	Grey	Dec 1952		A		DB
Cheltenham	Peel	Oct 1950	Oct 1951		P	DB
Chenaux	Renfrew	May 1950		A		Out
City View	Carleton	Oct 1953		A	P	Out
Clarkson	Peel	Nov 1949		A		DB
Clear Creek (R)	Norfolk	May 1942		A		OS
Clifford	Wellington	Aug 1950		A	P	DB
Clinton	Huron	Mar 1956		A		DB
Clontarf	Renfrew	June 1882		A		Out
Cobourg	Northumberland	May 1925	Dec 1932			Broken record
		Nov 1948	Nov 1951			
		Apr 1956		A		OS
Cochrane	Cochrane	June 1910		A		Out
Cochrane (For.)	Cochrane	May 1926	Dec 1932			Out
Cockburn Island	Manitoulin	Oct 1897	Feb 1910			OS
Coe Hill	Hastings	Apr 1948	Sept 1957		P	to T and P; DB
Colborne	Northumberland	Jan 1883	Mar 1886			Carlow
		June 1924	Mar 1925			OS
Coldstream	Simcoe	July 1888	Aug 1899		P	DB
Coldwater	Simcoe	May 1883	Jan 1923			
		Dec 1925		A		Broken record; DB
Collingwood	Simcoe	Nov 1869	Jan 1873			
		Jan 1892	Oct 1906			
		Aug 1910	Apr 1917			
		Jan 1920	Dec 1926			1925 obs. no good
		Jan 1935		A	P	DB

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Collingwood (Blue Mtns.)	Simcoe	Jan 1896	May 1901			DB
Combermere	Renfrew	Jan 1956	May 1957			Out
Conistogo	Waterloo	June 1880	Dec 1890			
		Jan 1894	Oct 1898			DB
Coniston	Sudbury	Apr 1921		A		DB
Copetown	Wentworth	June 1882	Sept 1892		P	Nelson; DB
Copper Cliff	Sudbury	Nov 1906	Oct 1914			DB
Cornwall	Stormont	Jan 1867	Dec 1887		P	
		Apr 1948	May 1950		P	Out
Cornwall (CKSF)	Stormont	Nov 1950		A		Out
Cornwall (O. Hydro.)	Stormont	Dec 1954		A		Out
Cornwall (St. L.H.S.)	Stormont	Jan 1958		A		Out
Cottam	Essex	June 1882	Feb 1922			DB
Couchiching Falls	Simcoe	July 1918	Oct 1923		P	DB
Credit	Peel	Sept 1880	Oct 1890		P	Summer only; DB
Crewson Corners	Wellington	Oct 1957		A	P	DB
Croydon	Lennox & Add.	Jan 1895	July 1908		P	DB
Crystal Falls	Nipissing	May 1922		A		Formerly called Smoky Falls; DB
Dacre	Renfrew	June 1926	Aug 1936			Summer station; Out
Dale	Durham	June 1957		A		Summer station; DB
Dalhousie Lake	Lanark	Sept 1923		A	P	High Falls; DB*
Dalhousie Mills	Glengarry	Apr 1899	Dec 1901			Out
Dealtown	Kent	Apr 1883	Sept 1904		P	DB
De Cewsville	Haldimand	Feb 1889	Dec 1890			
		Jan 1892	Dec 1897			DB
Delaware	Middlesex	Jan 1883	Oct 1886		P	DB
Delhi	Norfolk	June 1934		A		DB
Denbigh	Lennox & Add.	June 1883	Dec 1896		P	Out
Des Joachims	Renfrew	May 1950		A	P	Out
Desoronto	Hastings	June 1882	Sept 1905			OS
Dog Lake	Thunder Bay	July 1950		A		DB
Dog Lake Dam	Thunder Bay	July 1923	Nov 1930		P	Kaminstikwia; DB
Dog River	Thunder Bay	Sept 1957		A		DB
Dome	Cochrane	Mar 1911	June 1915			South Porcupine; Out
Domville	Grenville	Feb 1948	Aug 1954		P	DB
Dona	Thunder Bay	Oct 1926		A	P	DB
Doon	Waterloo	May 1948	Dec 1953		P	DB
Dorset	Muskoka	Aug 1949	Oct 1954			DB
Drayton	Wellington	May 1883	Aug 1889		P	DB
Dresden	Kent	July 1956		A		DB
Dryden	Kenora	Feb 1914		A		Out
Dunbarton	Ontario	Nov 1956		A	P	Summer station; OS
Dundas	Wentworth	Apr 1870	Feb 1874			DB
Dunnville	Haldimand	Jan 1900	Dec 1902			Pcpn only to 1957
		Oct 1953		A		DB
Dunnville (A)	Haldimand	May 1941	Oct 1944			DB
Dunnville (2)	Haldimand	July 1956	May 1957			DB
Dunvegan	Glengarry	Oct 1947	Aug 1949			Out
Durham	Grey	June 1882	July 1901			
		Sept 1927	Dec 1928			
		Sept 1935	Jan 1937			
		Nov 1947		A		Edgehill; DB
Dutton	Elgin	Mar 1913	July 1922			
		Jan 1926	Feb 1928			DB
Dutton (Cowal)	Elgin	Apr 1883	Dec 1914		P	Broken record; DB
Dyment	Kenora	Dec 1925	Oct 1927			Out

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Ear Falls	Patricia	Oct 1928	Aug 1939			
		Jan 1950		A		Out
Earlton (A)	Timiskaming	Sept 1938		A		DB
Edwardsburg	Grenville	June 1882	Dec 1887		P	DB
Egmondsville	Huron	July 1882	Dec 1887		P	DB
Egremont	Grey	Mar 1880	Dec 1893			DB
Elk Lake	Timiskaming	July 1926	Oct 1927		P	Out
Elmira	Waterloo	May 1955		A		Summer station; DB
Elmvale	Simcoe	May 1947	Jan 1952		Pc	Pcpn only to 1951; DB
Elora	Wellington	Jan 1882	Apr 1895			
		Apr 1909	Jan 1923			DB
Elsas	Algoma	Dec 1924	Oct 1930			Out
Emo	Rainy River	Apr 1922		A		Out
Emo (2)	Rainy River	May 1957		A		Pcpn only to 1958; Out
Emsdale	Parry Sound	Jan 1895	June 1924			
		June 1934	Sept 1952		P	DB
Englehart	Timiskaming	May 1948		A		Out
Ennismore	Peterborough	May 1882	Jan 1910		P	DB
Erasmus	Dufferin	Jan 1896	Dec 1903			DB
Espanola	Sudbury	Mar 1920	July 1930			Broken record; DB
Eugenia	Grey	May 1916		A	P	DB
Fenelon Falls	Victoria	July 1915	Aug 1917		P	
		Jan 1921		A		DB
Fergus	Wellington	Jan 1883	June 1894		P	
		Oct 1939		A		DB
Fitzroy Harbour	Carleton	Apr 1870	Dec 1884			
		Jan 1886	Nov 1887			Out
Florence	Lambton	Feb 1883	May 1887			DB
Foleyet	Sudbury	Apr 1931		A		DB
Fonthill	Welland	Nov 1945	Dec 1947			Ridgeville; DB
Forest	Lambton	Sept 1924		A		DB
Fort Frances	Rainy River	Jan 1892	Sept 1896			
		Sept 1912	Feb 1915			
		Oct 1916		A		Out
Fort Frances (For)	Rainy River	May 1943		A		Summer station; Out
Fort Hope	Patricia	Jan 1879	June 1881			Martins Falls to 1881
		Jan 1895	Dec 1909			
		Jan 1917	Aug 1923			Out
Fort William (A)	Thunder Bay	May 1924	June 1931			Broken record
		Aug 1941		A		Fort William/Port Arthur, Lakehead Airport; OS
Franz	Algoma	July 1917	Apr 1951			
		Feb 1953		A		DB
Franz (Forestry)	Algoma	May 1944	Aug 1952			Summer only, broken record; DB
Frederickhouse Lake Dam	Cochrane	Jan 1950		A		Out
Fournier	Prescott	May 1957		A		Out
Foymount	Renfrew	Apr 1956		A	P	Out
Fullarton	Perth	Aug 1956		A		DB
Galt	Waterloo	Jan 1878	June 1898			
		Apr 1948		A		DB
Geraldton (O. Hydro.)	Thunder Bay	June 1950		A	P	DB
Geraldton (For)	Thunder Bay	July 1948		A		(1948-51 summer station); DB

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Georgetown	Halton	Jan 1885		A		DB
Georgina (Sutton)	York	Oct 1869	Mar 1908			Broken record; DB
Gilmour	Hastings	June 1948	Feb 1955			
		Jan 1956	Sept 1957			Broken record; DB
Glastonbury	Lennox & Add.	Apr 1883	Nov 1885		P	
		Jan 1892	July 1894			
		Jan 1896	Dec 1897			DB
Glen Allen	Wellington	Aug 1955	Oct 1957		P	Summer station; DB
Glen Cairn	Simcoe	May 1883	Dec 1886		P	DB
Glencoe	Middlesex	Apr 1870	June 1873			
		Oct 1882	Sept 1883		P	
		May 1948		A		DB
Glen Collin	Elgin	Mar 1958		A		DB
Gloucester	Carleton	June 1954	Dec 1954		P	Out
Goderich	Huron	Dec 1866	Dec 1887			
		Aug 1929	Jan 1951			OS
Goderich Lighthouse	Huron	Jan 1875	Dec 1887		P	
		Jan 1906	Mar 1911			
		Mar 1912	Dec 1914			OS
Goderich Township	Huron	Mar 1915		A		Goderich (Ridge - crest); OS
Gogama	Sudbury	May 1926	Nov 1934		P	Out
Goodham	Haliburton	June 1948		A		Broken record; DB
Goose Island	Patricia	July 1930	Nov 1936			Summer station; Out
Gore Bay	Manitoulin	Oct 1915		A		OS
Gore Bay (A)	Manitoulin	July 1947		A		OS
Gores Landing	Northumberland	Aug 1943		A		DB
Graham (A)	Thunder Bay	Oct 1948		A		DB
Grand Valley	Dufferin	Mar 1910	Nov 1917		P	
		May 1934	Nov 1939			DB
Granton	Middlesex	Jan 1873	Dec 1886			DB
Grasset	Algoma	Sept 1913	Dec 1914			Instruments moved to Franz; DB
Gravenhurst	Muskoka	Nov 1870	Apr 1916			
		Feb 1918	June 1921			
		Apr 1948	Sept 1949		P	DB
Green River	York	Apr 1953	Sept 1957		P	DB
Grey County Forest	Grey	June 1953	Nov 1953		P	Sept only in 1954; DB
Grimsby	Lincoln	June 1910	Dec 1917			
		Mar 1921	Sept 1929			
		May 1931	Mar 1932			
		Sept 1934	Mar 1935			
		Jan 1937	Nov 1939			
		Nov 1944		A		OS
Grimsby (Rock Chapel)	Lincoln	Jan 1915	Dec 1928			
		Jan 1931		A		DB
Guelph	Wellington	May 1881	Dec 1894			
		Dec 1898		A		DB
Hagersville (A)	Haldimand	Dec 1941	Aug 1945			Broken record; DB
Hagersville	Haldimand	Apr 1948		A	P	DB
Hagersville (2)	Haldimand	July 1956		A		DB
Haileybury	Timiskaming	Nov 1894	July 1922			
		May 1930	Dec 1952			Out
Haliburton	Haliburton	Apr 1883		A		DB
Haliburton (2)	Haliburton	May 1949	Dec 1955			DB
Hamilton	Wentworth	Mar 1866	Dec 1887			
		Jan 1898	May 1904			
		Jan 1911	Dec 1929			
		May 1938		A		OS

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Hamilton (Gage Park)	Wentworth	Sept 1953	May 1956		P	OS
Hamilton (R.B.G.)	Wentworth	Apr 1950		A		OS
Hanlon	Peel	Oct 1950	Nov 1951		P	DB
Hanover Lake	Thunder Bay	May 1952	Sept 1955			Summer station; Out
Harrow	Essex	May 1917		A		DB
Harrowsmith	Frontenac	June 1883	July 1889			DB
Harwood	Northumberland	July 1953	Oct 1954			Summer station; DB
Hastings	Northumberland	Apr 1883	Nov 1885		P	DB
Hawkesbury	Prescott	Sept 1950		A		Out
Hearst	Cochrane	July 1929	Sept 1934		P	Summer station
		Oct 1951	May 1952			Out
Heart Lake	Peel	June 1957		A		DB
Heaslip	Timiskaming	Nov 1928		A		Out
Heeley Falls	Northumberland	Jan 1921	Dec 1930			
		Apr 1931	Nov 1937			DB
Heeley Falls (2)	Northumberland	Jan 1931	1940			DB
Helen Mine	Algoma	May 1940		A		DB
Heron Bay	Thunder Bay	Oct 1886	June 1891			
		Jan 1893	Feb 1902			
		July 1913	Nov 1920			Broken record
		Aug 1953	July 1954			Summer station; OS
Hespeler	Waterloo	June 1946	June 1947			Summer station; DB
Hillier	Prince Edward	July 1912	Jan 1920			OS
Hillsport	Thunder Bay	July 1929	May 1931			
		June 1951	Aug 1952		P	Summer station; Out
Holland Marsh	York	Aug 1946	Feb 1948			DB
Holstein	Grey	Feb 1953	Apr 1956			
		Jan 1957		A		DB
Hopeville	Grey	Nov 1947		A	P	DB
Hornby	Halton	June 1947		A	P	DB
Hornpayne	Algoma	June 1917		A		Broken record; DB
Hound Chute	Timiskaming	May 1950		A		Pcpn only to 1958; Out
Humber	York	May 1888	May 1890		P	DB
Hunta	Cochrane	Feb 1950		A		Out
Huntsville	Muskoka	Jan 1892	Dec 1904			
		Jan 1906	Aug 1908			
		July 1923		A		Broken record; DB
Ignace	Kenora	July 1889	June 1891			
		Jan 1914				Out
Ilderton	Middlesex	June 1951	Aug 1956			Pcpn only to 1953; DB
Indian Bay	Kenora	Mar 1914		A		Shoal Lake; Out
Indian Chute	Timiskaming	Jan 1912	Dec 1912			Elk Lake
		Feb 1950		A		Out
Ingersoll	Oxford	Apr 1870	Dec 1876			
		July 1879	Nov 1888			
		May 1956	Sept 1957		P	Summer only; DB
Ingolf	Kenora	Nov 1927	Sept 1941			Out
Iroquois Falls	Cochrane	Apr 1913		A		Out
Island Falls	Cochrane	Mar 1955		A		Out
Jackson Manion	Patricia	Sept 1928	July 1929			Out
Jarvis (A)	Haldimand	Sept 1939	Apr 1942			USWB Form 1135; DB
Jarvis	Haldimand	May 1954	May 1956			DB
Jarvis Lake Tower	Thunder Bay	Aug 1952	Aug 1956			Summer station; DB
Jermyn	Peterborough	Aug 1895	Aug 1905			DB
Joly	Parry Sound	Feb 1885	July 1892		P	DB
Judge	Timiskaming	Dec 1907	Apr 1909			Out

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Kagawong	Manitoulin	Jan 1951		A		OS
Kakabeka Falls	Thunder Bay	Nov 1908		A		DB
Kapuskasing (A)	Cochrane	Feb 1938		A		Out
Kapuskasing	Cochrane	Jan 1918		A		Experimental Farm; Out
Kapuskasing (2)	Cochrane	June 1934	Nov 1934			Out
Kashbowie	Thunder Bay	Sept 1956	Feb 1958			DB
Katrine	Parry Sound	Apr 1949	Oct 1949			DB
Kawene	Rainy River	Sept 1935	Jan 1951			DB
Kemptville	Grenville	Nov 1928	Feb 1937			
		May 1939		A		DB
Kenogami Dam	Thunder Bay	June 1950		A	P	DB
Kenora (A)	Kenora	Aug 1938		A		Out
Kenora	Kenora	Sept 1899	Mar 1939			Rat Portage; Out
Killala Lake	Thunder Bay	May 1945	July 1948			
		Aug 1952	Sept 1954			Summer station; DB
Killaloe (A)	Renfrew	Sept 1938		A		DB
Kincardine	Bruce	May 1870	Dec 1882			
		Jan 1888	Dec 1891			
		Jan 1894	June 1898		P	OS
Kingston (A)	Frontenac	Oct 1930	Mar 1932			
		Aug 1943	Sept 1945			OS
Kingston (Barriefield)	Frontenac	Apr 1939	July 1943			OS
Kingston (Alcan)	Frontenac	Feb 1947	Nov 1949			OS
Kingston (Frontenac)	Frontenac	Oct 1945		A		OS
Kingston (Queens U)	Frontenac	Jan 1874	Apr 1939			
		Nov 1945	Dec 1946			
		Oct 1951	Mar 1957			OS
Kingsville	Essex	Jan 1890	Sept 1892			
		Jan 1898	Dec 1904			
		Jan 1908	Sept 1919		P	OS
Kinmount	Victoria	Dec 1921	Apr 1926			
		Oct 1948	June 1950			DB
Kirkfield	Victoria	Apr 1883	Dec 1883			DB
Kirkland Lake	Timiskaming	Nov 1915	June 1916			
		Apr 1941	Feb 1942			
		Feb 1950		A		Out
Kirkton	Huron	Sept 1883	Dec 1886		P	DB
Kitchener	Waterloo	Oct 1914		A		Berlin; DB
Kohler	Haldimand	May 1949				DB
La Cave	Nipissing	May 1950		A		Out
Lac Seul	Patricia	Sept 1914	Apr 1934		P	Out
Lafontaine	Simcoe	Sept 1947	Jan 1950			
		July 1953		A		DB
Lakefield	Peterborough	Sept 1874	Nov 1875			
		Oct 1876	Feb 1949			DB
Lakeport	Northumberland	Apr 1952		A		DB
Lake St. Joseph	Patricia	July 1930	Dec 1930		P	Out
Lamable	Hastings	Apr 1883	July 1887		P	Hastings; Out
Lansdowne	Leeds	June 1895	Jan 1910		P	DB
Lansdowne House	Patricia	Mar 1941		A		Out
Leamington	Essex	Mar 1916		A		OS
Lindsay	Victoria	Jan 1880		A		DB
Lions Head	Bruce	Oct 1883	Dec 1896		P	OS

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Listowel	Perth	May 1880	Apr 1889			
		May 1899	July 1904			
		Jan 1906	Dec 1906			
		Nov 1912	Dec 1916			
		Jan 1918	Dec 1918			
		Mar 1921	Sept 1923			
		Nov 1924	Mar 1925			
		Sept 1950	Mar 1955			
		Jan 1957		A		DB
Little Current	Manitoulin	Aug 1871	Dec 1881			Broken record
		Aug 1886	Oct 1890			
		July 1892	Dec 1892			OS
Little Forks	Rainy River	Nov 1890	May 1893			Out
Lodi	Stormont	July 1882	May 1883		P	Out
London	Middlesex	Dec 1871	Apr 1874			
		Oct 1878	Dec 1879			
		Jan 1881	Jan 1887			DB
London (2)	Middlesex	Mar 1883	July 1890			DB
London (South)	Middlesex	Sept 1890	Jan 1932			DB
London (Lambeth)	Middlesex	May 1932	Mar 1941			Old London Airport; DB
London (A)	Middlesex	July 1940		A		Crumlin Airport; DB
London (Roehampton)	Middlesex	July 1956	Sept 1957		P	DB
London (Sharon Dr.)	Middlesex	Sept 1956		A	P	DB
Long Branch	York	Jan 1951	Dec 1951		P	OS
Long Lac	Thunder Bay	Mar 1921	Oct 1957			DB
Long Lac Control Dam	Thunder Bay	June 1950	Oct 1957		P	DB
Long Lac (P & P)	Thunder Bay	Jan 1951		A		DB
Long Point	Norfolk	Oct 1914	Dec 1954			OS
Lorne Park	Peel	Dec 1908	Apr 1912			DB
Low Bush	Cochrane	May 1951	Nov 1954			Out
Lower Sturgeon	Cochrane	Sept 1950		A	P	Out
Lucan	Middlesex	Mar 1871	June 1873			
		Jan 1881	Dec 1883			
		Aug 1915		A		DB
Lucknow	Bruce	Jan 1885		A		Broken record; DB
Lundys Lane	Welland	Apr 1885	Dec 1893			
		June 1913	Sept 1915			
		Feb 1920	Nov 1922		P	Niagara; DB
Luther Dam	Dufferin	Jan 1951	Aug 1954			Pcpn only in 1951; DB
Lyons	Elgin	May 1883	Oct 1894		P	DB
Mac Diarmid	Thunder Bay	July 1926		A	P	Summer only to 1931 and since 1951; DB
Mac Cue	Lanark	May 1883	Sept 1918		P	Oliver's Ferry; DB
Madawaska	Nipissing	Aug 1915		A		DB
Madoc	Hastings	Jan 1905	July 1914			DB
Maidstone	Essex	May 1882	Dec 1890		P	DB
Magnetawan	Parry Sound	Jan 1924		A		DB
Maitland	Grenville	June 1953	Apr 1954			OS
Mamainse	Algoma	Jan 1883	Jan 1885		P	DB
Manitou Falls	Thunder Bay	May 1948	July 1955			Summer only, broken record; DB
Manitou Lake	Thunder Bay	Sept 1931	Sept 1937			Summer only; DB
Manitowadge	Thunder Bay	Feb 1956		A		DB
Manitowaning	Manitoulin	July 1880	Jan 1882			
		Jan 1933	Sept 1941			
		Feb 1943	June 1943			OS
Manotick	Carleton	Oct 1953	Dec 1956		P	Out

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Mansfield	Dufferin	May 1947	Dec 1947		P	DB
Maple	York	Oct 1887	July 1888			
		May 1957		A	P	DB
Marathon	Thunder Bay	July 1945	Sept 1945			
		Feb 1950	Sept 1950			
		Aug 1951		A		Broken record; OS
Markdale	Grey	Apr 1912	Jan 1920			DB
Markham	York	Dec 1869	Dec 1872			
		Feb 1957		A	P	DB
Martin	Kenora	Sept 1957		A		Out
Matheson	Cochrane	May 1911	Oct 1911			Hyslop; Out
Mattagami Dam	Sudbury	Nov 1950	Aug 1951			
		Dec 1952	Feb 1957			DB
Mattagami Patrol Dam	Sudbury	Feb 1957		A		DB
Mattawa	Nipissing	July 1882	June 1883			
		May 1886	Sept 1899			Out
McVittie	Sudbury	Apr 1899	Sept 1910			
		May 1950		A		DB
Meaford	Grey	June 1913	Jan 1924			
		Apr 1948	Mar 1949			
		June 1957		A		OS
Merrickville	Grenville	May 1882	Sept 1885			
		Jan 1888	Aug 1890		P	Out
Meyersburg	Northumberland	Oct 1930		A		DB
Michipicotin Falls	Algoma	Dec 1916	Dec 1928		P	DB
Midhurst	Simcoe	July 1952		A		DB
Midland	Simcoe	Nov 1888	Jan 1915			
		May 1948		A		OS
Midlothian	Parry Sound	Nov 1888	Dec 1896		P	Burks Falls; DB
Mildmay	Bruce	Aug 1950	Oct 1953			Broken record; DB
Miller Lake Forest	Bruce	Oct 1952		A	P	DB
Millgrove	Wentworth	June 1951		A		DB
Milton West	Halton	Oct 1950	Mar 1952			DB
Minaki	Kenora	May 1930	Sept 1946			Summer only; Out
Minden	Haliburton	Mar 1886	June 1890			
		Oct 1942	Sept 1950		P	DB
Minden (2)	Haliburton	Oct 1948	Apr 1949			
		Jan 1956		A		DB
Minden (Forestry)	Haliburton	June 1948	May 1955			Broken record; DB
Mine Centre	Rainy River	Nov 1914		A		Out
Minesing	Simcoe	July 1925	Mar 1926		P	DB
Mink Lake	Algoma	Apr 1948	Apr 1951			DB
Mistinikon	Timiskaming	June 1950		A	P	To July 1952; Out
Missinabie	Sudbury	Sept 1889	Dec 1901			DB
Mitchell	Perth	Nov 1948		A		DB
Mitchell (2)	Perth	May 1956	July 1957		P	Summer only; DB
Mobert	Thunder Bay	July 1929	Sept 1930		P	DB
Mono Mills	Dufferin	May 1922	Sept 1924			DB
Montague	Lanark	Jan 1896	Dec 1914			Smith Falls; Out
Monticello	Dufferin	Oct 1954		A		DB
Montreal Falls	Algoma	Jan 1942	Apr 1946			
		Nov 1949	Dec 1955			DB
Montreal River	Timiskaming	Dec 1910		A		DB
Moose Factory	Cochrane	Jan 1878	May 1882			
		Jan 1884	Dec 1884			
		Oct 1889	Dec 1938			Out
Moose Lake	Rainy River	June 1950		A	P	DB
Moosonee	Cochrane	Oct 1932		A		Out
Morrisburg	Dundas	June 1913		A		Out
Morriston	Wellington	Apr 1948		A	P	DB

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Mount Brydges	Middlesex	Jan 1958		A		DB
Mount Forest	Wellington	Jan 1881	Dec 1898			
		July 1915	Dec 1948			DB
Mount Hope (A)	Wentworth	Nov 1941	Aug 1945			DB
Mount Oliver	Peel	Nov 1950	July 1951		P	DB
Muir	Oxford	July 1955	Aug 1956		P	DB
Muskoka (A)	Muskoka	July 1934	Dec 1937		P	Reay
		Dec 1938				DB
Nakina (A)	Thunder Bay	June 1939		A		DB
Nakina (Forestry)	Thunder Bay	June 1929	May 1944		P	Summer station; DB
Nakina	Thunder Bay	June 1934	Aug 1936			DB
Nestor Falls	Kenora	May 1932	Sept 1934			Out
Newburgh	Lennox & Add.	June 1882	Sept 1883		P	DB
New Glasgow	Elgin	July 1957		A		OS
New Liskeard	Timiskaming	Oct 1923	Apr 1933			
		May 1935		A		Out
Newmarket	York	May 1871	Aug 1873			Summer only
		Apr 1875	Dec 1882			
		July 1956		A		DB
Niagara	Welland	Apr 1871	Sept 1872			OS
Niagara Falls	Welland	July 1918	Dec 1918			
		Jan 1920	Dec 1922			
		Jan 1934		A		OS
Niagara Falls (O. Hydro.)	Welland	Sept 1921		A		Niagara Falls View; OS
Niagara Falls S.	Welland	Apr 1885	Dec 1892			
		July 1919	Dec 1921			OS
Niagara-on-the-Lake	Lincoln	Jan 1935	June 1936			OS
Nipigon	Thunder Bay	Sept 1886	June 1898			
		July 1913	Dec 1914			
		June 1920	Dec 1922			OS
Nipissing	Nipissing	Oct 1915	Nov 1919			
		Jan 1925	Jan 1933			DB
North Bay	Nipissing	Jan 1887	Oct 1889			
		Jan 1895	Apr 1898			
		June 1915	Mar 1920			
		Aug 1924		A		DB
North Bay (A)	Nipissing	Jan 1939		A		DB
North Bay (2)	Nipissing	July 1934	Mar 1935			DB
North Bruce	Bruce	June 1888	Dec 1922			DB
Northcote	Renfrew	May 1880	Dec 1887			Out
North Glandford	Wentworth	June 1882	June 1890		P	DB
North Gower	Carleton	Jan 1906	Dec 1925			Out
North Gwillimbury	York	Oct 1869	Dec 1877			DB
North Lake	Thunder Bay	June 1921	Oct 1941			DB*
Norwich	Oxford	May 1887	Oct 1888		P	DB
Norwood	Peterborough	Jan 1876	Dec 1880			
		July 1883	Dec 1889			
		Oct 1912	Jan 1918			DB
Oakville	Halton	Sept 1956		A		OS
Oak Ridges	York	June 1918		A		DB
Oba	Algoma	Feb 1926	Oct 1940			Out
Oil City	Lambton	Nov 1953		A		DB
Oil Springs	Lambton	May 1883	Mar 1892		P	DB
Orangeville	Dufferin	Jan 1884	Dec 1912		P	
		July 1949		A		Melville; DB
Orillia	Simcoe	May 1871	Dec 1918			
		Jan 1926		A		DB

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Orillia (S.T.P.)	Simcoe	Feb 1957		A	P	DB
Orleans (V.P.G.)	Carleton	Dec 1953		A	P	Broken record; Out
Orono	Durham	May 1923		A		DB
Oscar	Thunder Bay	Jan 1914	Mar 1915			DB
Oshawa	Ontario	Sept 1882	Jan 1891			
		Nov 1912	Dec 1918			
		June 1923	Dec 1925			
		Dec 1952				OS
Otonabee	Peterborough	Jan 1895	May 1911			DB
Ottawa						
(City)	Carleton	Apr 1872	Mar 1890			
		Apr 1899	Mar 1935			Out
(Albion Rd.)	Carleton	Apr 1954	Nov 1954		P	Out
(Bayview)	Carleton	Nov 1953	Dec 1955			Out
(Beckwith Rd.)	Carleton	Jan 1955		A		Out
(Billings Bdge)	Carleton	Oct 1953	Oct 1954		P	Out
(Exp. Farm)	Carleton	Apr 1890	Mar 1899			
		Jan 1915		A		Out
(Hogs Back)	Carleton	Oct 1953	Nov 1954		P	Out
(LaSalle Acad.)	Carleton	Dec 1954		A	P	Out
(Lemieux Is.)	Carleton	Oct 1953		A	P	Out
(N.R.C.)	Carleton	Nov 1951		A		Out
(Rockcliffe) (A)	Carleton	Apr 1942		A		DB*
(University)	Carleton	Oct 1954	Mar 1955			Out
(Uplands (A)	Carleton	Oct 1938		A		DB*
Otterville	Oxford	Sept 1882	Dec 1887		P	DB
Owen Sound	Grey	July 1878	Feb 1912			
		Jan 1916		A		OS
Oxaline Lake	Thunder Bay	Aug 1952	Sept 1956			DB
Pagwa	Cochrane	May 1918	Aug 1934			Out
Pagwa (A)	Cochrane	Aug 1938		A		DB*
Palgrave	Peel	Jan 1956		A		DB
Paris	Brant	Apr 1884	Oct 1945			DB
Parkhill	Middlesex	Jan 1871	Mar 1873			DB
Parma	Lennox & Add.	Jan 1906	Mar 1907			DB
Parry Sound	Parry Sound	Oct 1874	Dec 1888			
		Jan 1907	Dec 1909			
		Jan 1911		A		OS
Pays Plat	Thunder Bay	Aug 1944		A		DB
Pelee Island	Essex	Jan 1882	Apr 1898			
		Oct 1899	Dec 1903			
		Jan 1905	Aug 1913			
		June 1915	June 1917			Broken record
		Apr 1919	Mar 1931			
		July 1933		A		OS
Pefferlaw	York	May 1948		A	P	Only to 1950; DB
Pembroke	Renfrew	Feb 1866	May 1888			
		July 1915		A		Out
Pembroke (Forestry)	Renfrew	May 1926	Sept 1942		P	Summer station; Out
Penetanguishene	Simcoe	Jan 1882	July 1884		P	OS
Perth	Lanark	Oct 1947	Feb 1949			Out
Peshu Lake	Algoma	May 1950	Aug 1955			Summer station; DB
Peterbell	Algoma	Mar 1929	Sept 1930			Out
Peterborough						
(O. Hydro.)	Peterborough	Sept 1949		A	P	DB
Peterborough	Peterborough	Apr 1866	Dec 1887			
		Jan 1891		A		DB
Peters Corners	Wentworth	Apr 1952		A		DB

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Petrolia	Lambton	Apr 1883	June 1888			
		Nov 1953		A	P	DB
Petrolia (2)	Lambton	Dec 1885	June 1888		P	DB
Pickle Lake	Patricia	July 1930	Sept 1930		P	
		June 1933		A		Broken record; Out
Picton	Prince Edward	Nov 1915	July 1920		P	
		Jan 1934	Aug 1938		P	
		Oct 1956	Oct 1957			OS
Pine Grove	York	July 1957		A	P	DB
Pine Portage	Thunder Bay	June 1950		A	P	DB
Plattsville	Oxford	July 1871	Dec 1872			DB
Point Clark	Bruce	Jan 1871	Mar 1914			OS
Pontypool	Durham	Sept 1947	Oct 1949		P	DB
Poplar Mills	Middlesex	Mar 1956		A	P	DB
Porcupine	Cochrane	Jan 1914	June 1915			Out
Porquis Junction (A)	Cochrane	Oct 1938	Mar 1955			Out
Port Albert (A)	Huron	July 1941	Nov 1945			OS
Port Arthur	Thunder Bay	Jan 1880	July 1941			OS
Port Arthur (Forestry)	Thunder Bay	June 1926	Sept 1934		P	OS
Port Arthur (2)	Thunder Bay	Jan 1936	Apr 1939			Storm Signal Sta. A; OS
Port Burwell	Elgin	Jan 1904	Feb 1916			OS
		Aug 1917	Aug 1918			
		Jan 1920	July 1921			Broken record; OS
Port Credit	Peel	Nov 1948	Mar 1949			
		Nov 1951		A	P	OS
Port Dalhousie	Lincoln	Jan 1875	Dec 1878			
		Jan 1910	June 1921		P	Grantham
		May 1957		A		OS
Port Dover	Norfolk	Jan 1874		A		Observations no good 1924-28; OS
Port Elmsley	Lanark	Mar 1948		A		(Perth) P to 1951; DB
Port Hope	Durham	Jan 1884	Dec 1890			
		Dec 1891	Dec 1892			
		Apr 1896	Feb 1910			OS
Port Perry	Ontario	Apr 1885	Dec 1889		P	DB
Portland	Leeds	Apr 1953	Feb 1958			DB
Port Rowan	Norfolk	Jan 1894	Oct 1898		P	OS
Port Stanley	Elgin	Jan 1874	Mar 1924			
		Aug 1948	Jan 1950			
		Aug 1957				OS
Presqu' Isle	Grey	July 1875	Aug 1898		P	OS
Preston	Waterloo	May 1953		A		DB
Princeton	Oxford	Apr 1883	Aug 1913		P	DB
Prospect Hill	Perth	Mar 1956		A	P	DB
Providence Bay	Manitoulin	July 1897	Dec 1903			
		May 1911	Apr 1940			OS
Purdy	Hastings	July 1955		A	P	Out
Putnam	Middlesex	Apr 1883	June 1886		P	DB
Queensboro	Hastings	Aug 1914	Dec 1946			Broken record; DB
Queenston	Welland	Mar 1922	July 1928			OS
Quorn	Kenora	Apr 1915		A		DB
Ragged Rapids	Muskoka	May 1950		A		DB
Rainy River	Rainy River	Apr 1916	Dec 1927			Out
Ramsay	Sudbury	Nov 1948		A	P	DB
Ranelagh	Brant	May 1883	Oct 1885		P	DB

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Ranger Lake	Sudbury	May 1938	Apr 1943			
		Nov 1949	Apr 1953			Broken record; DB
Rat Rapids	Patricia	July 1934	July 1953			Out
Ravenna	Grey	June 1948	Jan 1953			DB
Rayner	Algoma	May 1950		A		DB
Red Cedar Lake Dam	Nipissing	May 1950	Sept 1954		P	DB
Redickville	Dufferin	Oct 1944		A		DB
Red Lake	Patricia	Aug 1930	Aug 1934			
		Aug 1938	July 1957			Out
Redmond	Thunder Bay	June 1952	Sept 1956			Summer station; Out
Regent	Algoma	Jan 1932	Nov 1935			DB
Renfrew	Renfrew	Aug 1882	Oct 1899			
		July 1902		A		Out
Reserve 40	Kenora	June 1913	Dec 1913			Ingolf; Out
Richards Landing	Algoma	Apr 1924	July 1926			OS
Rideau Canal						
(Bobs Lake)	Frontenac	Dec 1953		A		Out
(Burrits Ldg)	Lanark	Dec 1953		A		Out
(Jones Falls)	Leeds	Dec 1953		A		DB
(Kilmarnock)	Lanark	Dec 1953		A		Out
(Long Island)	Carleton	Dec 1953		A		Out
(Narrows)	Lanark	Dec 1953		A		DB
(Upper Brewers)	Frontenac	Dec 1953		A		DB
(Wolfe Lake)	Frontenac	Dec 1953		A		DB
Rideau Ferry	Lanark	May 1948		A	P	DB
Ridgetown	Kent	Apr 1883	June 1903			
		June 1923		A		DB
Ridgeville	Welland	Feb 1950		A		Broken record; DB
Roblin's Mills	Prince Edward	Jan 1896	Dec 1899		P	DB
Rockcliffe	Nipissing	Jan 1877	Oct 1921			Stonecliff; DB
Rocklyn	Grey	Feb 1901	Dec 1904			DB
Ronville	Muskoka	Jan 1908	Sept 1926			DB
Rossport	Thunder Bay	Nov 1915	May 1916		P	OS
Rouge Hills	Ontario	Feb 1954	Oct 1955		P	OS
Round Lake	Timiskaming	June 1934	Nov 1934			DB
Ruel	Sudbury	Aug 1915		A		DB
Russell	Russell	Mar 1954		A		Out
Rutherglen	Nipissing	Apr 1891	Oct 1894			
		Apr 1895	Sept 1940			Lake Talon Calvin; DB*
St. Ann's	Lincoln	Mar 1895	Apr 1900			
		Aug 1923	July 1925			DB
St. Catharines (P. Lab.)	Lincoln	Nov 1928		A		DB
St. Catharines	Lincoln	Nov 1901	Oct 1903			
		Mar 1911	July 1912			
		June 1915	Dec 1915			
		July 1918	Nov 1956			DB
St. George	Brant	Apr 1883	Dec 1916			DB
St. Joachim	Essex	June 1951		A		P till 1953; DB
St. Marys	Perth	Jan 1888	July 1901			DB
St. Thomas	Elgin	July 1882	Dec 1887			
		Feb 1890	Dec 1894			
		Oct 1925		A		DB
St. Williams	Norfolk	Apr 1954		A		OS
Sand Hill	Peel	May 1946	Oct 1947			DB
Sand Lake	Algoma	Nov 1950	Apr 1951			
		Nov 1951	Mar 1952			
		May 1953	Aug 1956			Summer station; DB

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Sandy Falls	Cochrane	Sept 1950		A	P	Out
Sarnia	Lambton	July 1882	Apr 1912			
		Nov 1926	July 1927			
		Nov 1948		A		Sykeston; OS
Sarnia (R)	Lambton	Sept 1948	June 1951			OS
Sauble Forest	Bruce	Dec 1952		A	P	DB
Sault Ste Marie	Algoma	July 1889	Aug 1895			
		Apr 1921	Oct 1933			
		June 1945		A		OS
Sault Ste Marie (2)	Algoma	Sept 1957		A		OS
Sault Ste Marie (For)	Algoma	June 1926	Apr 1931			
		May 1943	Sept 1944			Summer station 1943-44; OS
Sault Ste Marie (Insect)	Algoma	May 1950	Sept 1954			Point aux Pins Insectary; OS
Sault Ste Marie (Shingwauk)	Algoma	Sept 1954	Nov 1955			Shingwauk School; OS
Savanne	Thunder Bay	Jan 1885	July 1906			
		Jan 1914	Sept 1946			DB*
Savant Lake	Thunder Bay	July 1930	July 1944		P	Summer station; Out
Scarboro	York	May 1883	Dec 1906			
		Oct 1911	Apr 1912			DB
Schreiber	Thunder Bay	Apr 1909		A		OS
Scotia Junction	Parry Sound	July 1924		A	P	DB
Seaforth	Huron	Nov 1870	Mar 1873			Broken record; OS
Searchmont	Algoma	Aug 1915	Sept 1918			DB
Seeley	Muskoka	Jan 1875	Dec 1884			Huntsville; DB
Sellwood Junction	Nipissing	May 1915	Dec 1915			Out
Shannonville	Hastings	Jan 1884	Dec 1894			OS
Sharon	York	Apr 1886	Dec 1892			DB
Shelburne	Dufferin	Sept 1909	Feb 1913			DB
Shirley Bay	Carleton	Feb 1954	Oct 1956		P	Out
Simcoe	Norfolk	Mar 1866	Jan 1888			
		Jan 1921		A		DB
Sioux Lookout (2)	Kenora	Jan 1914	Sept 1934			Out
Sioux Lookout (A)	Kenora	Aug 1930		A		In town before 1935; Out
Sioux Lookout (3)	Kenora	Apr 1930	Dec 1933			Summer station; Out
Sioux Narrows	Kenora	Oct 1933	Sept 1936			
		June 1940	Aug 1955			Out
Smith Falls	Lanark	May 1902	Dec 1905			
		May 1921	May 1923			Broken record; DB*
Smithfield	Northumberland	Aug 1949		A		DB
Smoky Falls	Cochrane	May 1922		A		Crystal Falls; DB
Snelgrove	Peel	Nov 1950		A	P	DB
Sombra	Lambton	Mar 1887	Dec 1892			Broken record; OS
South Bay Mouth	Manitoulin	Aug 1954		A		OS
South Falls	Muskoka	June 1920	Jan 1925			
		Nov 1956		A		Muskoka Falls; DB
Southampton	Bruce	Jan 1874	Nov 1952			
		Sept 1953	Dec 1956			Saugeen; OS
Spencerville	Grenville	Feb 1953		A		Out
Stayner	Simcoe	Feb 1870	July 1879			
		Apr 1948	Feb 1953			
		Jan 1954	Dec 1957			Broken record; DB
Stayner (2)	Simcoe	Apr 1955		A		DB
Steep Hill Falls	Algoma	Mar 1915	Aug 1939			DB
Stevens	Thunder Bay	Jan 1945	June 1946			
		Sept 1949	Sept 1955			Out

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Stevens (Camp 102)	Thunder Bay	May 1948	Mar 1949			Out
Stewartville	Renfrew	May 1950		A	P	Out
Stirling	Hastings	May 1883	Nov 1885			DB
Stirling (R)	Hastings	Mar 1940		A		DB
Stoney Creek	Wentworth	Jan 1884	Oct 1927			OS
Stoney Point	Essex	May 1882	Dec 1883			OS
Stouffville	York	Feb 1895	July 1901			DB
Stratford	Perth	Sept 1860	Dec 1887			
		Jan 1894		A		DB
Strathburn	Middlesex	Sept 1939	Apr 1942			USWB Form 1135; DB
Strathroy	Middlesex	Mar 1879	Apr 1885			
		Jan 1907	Nov 1913			
		Oct 1953	Aug 1954		P	DB
Sturgeon Falls	Nipissing	Jan 1883	July 1884			
		May 1900	Oct 1901			
		Mar 1915	Dec 1922			DB
Sudbury	Sudbury	July 1887	Nov 1889			
		Aug 1914	July 1930			DB
		May 1918	July 1930			DB
		Aug 1947	Jan 1955			DB
(A)	Sudbury	Feb 1954		A		DB
(Forestry)	Sudbury	May 1926	Nov 1934			DB
Summit Control Dam	Thunder Bay	June 1950		A	P	Out
Sundridge	Parry Sound	Jan 1914	May 1915			
		May 1928	Oct 1928			DB
Sunshine	Huron	Apr 1883	Dec 1904			DB
Swains Lake	Patricia	June 1933	Oct 1934		P	Out
Sydenham	Frontenac	Sept 1903	Feb 1917		P	DB
Talbotville	Elgin	July 1953		A	P	DB
Tavistock	Oxford	June 1956	Nov 1956		P	DB
Tecumseh	Essex	Jan 1883	July 1883		P	OS
Teeswater	Bruce	May 1883	Nov 1885			
		Apr 1887	Sept 1887		P	DB
Thedford	Lambton	Apr 1883	Feb 1897		P	DB
Thompson	Algoma	Feb 1890	Dec 1899		P	OS
Thornbury	Grey	May 1948	Sept 1951		P	Summer station; OS
Thornhill	York	Feb 1870	Jan 1872			DB
Thorold	Welland	Dec 1893	Feb 1897		P	DB
Tilbury	Kent	Mar 1948	Feb 1949		P	DB
Timagami	Nipissing	May 1934	Sept 1940			Broken record; Out
Timagami (Post)	Nipissing	June 1926	Sept 1928			Out
Timmins	Cochrane	Apr 1922		A		Out
(A)	Cochrane	Apr 1955		A		Out
(Ont. Hydro.)	Cochrane	July 1951		A	P	Out
Tobermory	Bruce	Feb 1914	Sept 1955			
		June 1956		A		Broken record; OS
Toronto	York	Dec 1839		A		Longest record in Canada. Homogeneous record begins Jan. 1841; OS
Toronto						
(Admiral Rd)	York	Mar 1949	Oct 1954			OS
(Beverley Hills)	York	Nov 1957		A	P	DB
(Birch Cliff)	York	Dec 1952	Dec 1953		P	OS
(Balmy Beach)	York	Jan 1953	Aug 1956		P	OS
(Bloordale)	York	June 1957		A	P	DB
(Broadview)	York	Dec 1955		A	P	DB
(Centre Is.)	York	Jan 1951	Jan 1952		P	DB

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Toronto (cont'd)						
(Deer Park)	York	Sept 1890	Jan 1933		P	DB
(Dorset Park)	York	Nov 1957		A	P	DB
(Downsview)(A)	York	Sept 1956		A		DB
(Downsview S)	York	Jan 1951		A	P	DB
(Dufferin)(A)	York	Apr 1930	Mar 1932			DB
East	York	Mar 1907	July 1911			
		May 1947	May 1951			DB
(East York)	York	Jan 1951	June 1957		P	To July 1952; DB
(Fairbank)	York	Apr 1948	June 1949		P	DB
(Fallingbrook)	York	Nov 1956		A	P	DB
(Glendale)	York	Nov 1957		A	P	DB
(Glenview)	York	Jan 1953		A	P	DB
(Highland Creek)	York	Nov 1955		A	P	OS
(High Park)	York	Jan 1951		A	P	OS
(Humber Bay)	York	Dec 1956		A	P	DB
(Island)	York	Jan 1905	Aug 1927		P	Lakeside Home
		May 1953		A		OS
(Island)(A)	York	Feb 1957		A		OS
(Islington West)	York	Jan 1951		A	P	DB
(Kingsway)	York	Jan 1951		A	P	DB
(Mimico)	York	Feb 1958		A	P	OS
(Malton)(A)	York	Nov 1937		A		Malton (A); DB
(Newtonbrook)	York	Oct 1953	June 1957			OS
(Northcliffe)	York	Oct 1957		A	P	DB
(Queensway)	York	Jan 1951	Sept 1951		P	DB
(Rexdale)	York	Oct 1957		A	P	DB
(Scarborough)	York	May 1953	Oct 1953		P	OS
(Scarlett Rd)	York	Jan 1951	Dec 1954		P	DB
(South Leaside)	York	June 1951	Jan 1958		P	Broken record; DB
(Sunnyside)	York	Jan 1951	July 1951		P	DB
(Victoria)	York	Oct 1957		A	P	DB
(West Hill)	York	Jan 1951	Jan 1958		P	OS
(Wexford)	York	Apr 1953	Feb 1958		P	DB
(Willowdale)	York	Nov 1953	June 1955			
		May 1956		A	P	DB
(Wilson Heights)	York	July 1953		A		DB
Trenton	Hastings	Apr 1883	Sept 1886			OS
Trenton (O. Hydro.)	Hastings	July 1915		A		OS
Trenton (A)	Hastings	Jan 1935		A		OS
Trethewey	Muskoka	May 1950	Oct 1956		P	DB
Trout Lake	Patricia	Nov 1915	Dec 1927			
		Feb 1939		A		Broken record; Out
Turbine (High Falls)	Sudbury	June 1914		A		DB
Tweed	Hastings	Apr 1925	Nov 1948			
		Dec 1950		A		DB
Twin Falls	Cochrane	Mar 1955		A		P only in 1957; Out
Uchi Lake	Patricia	July 1950	May 1953		P	Out
Uplands	Parry Sound	July 1886	Feb 1913			DB
Upper Notch	Timiskaming	Sept 1929	Nov 1934			
		June 1950		A	P	Out
Upsala	Thunder Bay	July 1947		A		DB
Ursa	Haliburton	Jan 1895	Mar 1907			
		Jan 1909	Sept 1913			DB
Uxbridge	Ontario	May 1899	Dec 1923			
		Oct 1929	Sept 1950			DB
Uxbridge (2)	Ontario	Apr 1948		A		P to 1950; DB
Valora	Kenora	Sept 1957		A		Out

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Vankleek Hill	Prescott	Jan 1903	Feb 1906			
		Nov 1915	June 1925			
		Dec 1936	Mar 1938			Out
Victoria	Peel	Feb 1952	Nov 1954		P	OS
Vienna	Elgin	June 1875	Nov 1877			DB
Vineland	Lincoln	Oct 1924		A		DB
Virgil	Lincoln	Jan 1894	Dec 1898		P	DB
Waboose Dam	Thunder Bay	Aug 1941	Sept 1956			Out
Wagaming	Thunder Bay	June 1934	Nov 1936			
		Aug 1938	Dec 1939			Armstrong; DB
Waldemar	Dufferin	July 1955		A		DB
Walkers Point	Muskoka	Nov 1928	Feb 1935			DB
Walkerton	Bruce	July 1915		A		DB
Walkerton (2)	Bruce	Apr 1957		A		DB
Walkerville	Essex	Dec 1929	Sept 1931			OS
Wallaceburg	Kent	Jan 1905		A		Broken record; DB
Wanapitei	Sudbury	June 1950	Jan 1952		P	To Jan. 1951; DB
Wanstead	Lambton	Apr 1887	June 1890			DB
Wasdells	Ontario	May 1920	Sept 1921			
		May 1950	Mar 1957		P	from 1953-57; DB
Washago	Simcoe	Jan 1928		A	P	DB
Warkworth	Northumberland	May 1887	Dec 1888		P	DB
Watcomb	Kenora	June 1933	Sept 1935			Summer station; Out
Waterford	Norfolk	Jan 1894	Dec 1896			
		Mar 1948		A	P	DB
Watford	Lambton	Apr 1883	Dec 1901			
		Jan 1912	Dec 1915			
		Jan 1919	Aug 1923			
		Nov 1924	Mar 1929			DB
Wattenwyl	Parry Sound	Mar 1912	Mar 1913		P	DB
Waubaushene	Simcoe	May 1936	Nov 1956			OS
Wawaitin Falls	Cochrane	Jan 1913		A		Out
Welland	Welland	Oct 1872	Aug 1879			
		Sept 1880	Dec 1886			
		Mar 1892		A		DB
Wellington	Prince Edward	May 1948	June 1951			OS
Wesley	Wellington	Feb 1909	Jan 1913		P	DB
Westminster	Middlesex	Jan 1883	Dec 1933		P	Wilton Grove; DB
Weston	York	Oct 1869	July 1871			
		Apr 1948	Mar 1950		P	DB
Weston (Humber Hts.)	York	Mar 1948	Nov 1948			DB
Westport	Leeds	Jan 1901	Dec 1920		P	DB*
Wexford	York	May 1912	July 1929			DB
Wheatley	Essex	June 1887	July 1889			OS
Whitefish	Kenora	Jan 1915	Dec 1930		P	
		Jan 1934	Sept 1946			DB
White River	Algoma	Sept 1886		A		DB
Wiarton	Bruce	May 1883	Mar 1932			
		May 1934	Nov 1936		P	OS
Wiarton (A)	Bruce	July 1947		A		OS
Widder	Lambton	Feb 1870	Apr 1872			DB
Wilsonville	Norfolk	July 1883	Aug 1886			Broken record; DB
Windsor	Essex	June 1866	Dec 1887			
		Jan 1897	Dec 1915			
		Aug 1924	Aug 1929			OS
Windsor (A)	Essex	Aug 1940		A		DB
Windsor South	Essex	June 1952	Mar 1955			OS
Winona	Wentworth	Mar 1890	Dec 1890			
		Jan 1892	July 1892		P	OS

Station	County or District	Open	Close	Active 1958	Pcpn only	Notes
Woman Lake	Patricia	Nov 1934	Feb 1936			Out
Woodbridge	York	Oct 1948		A		DB
Woodslee	Essex	Oct 1946		A		DB
Woodstock	Oxford	Feb 1870		A		DB
Wooler	Northumberland	July 1897	Dec 1912		P	Sunnyside; DB
Wyoming	Lambton	May 1888	Apr 1907		P	DB
York	Haldimand	Jan 1936	Oct 1938			DB
Zurich	Huron	July 1881	Dec 1892			DB

* U.S. GOVERNMENT PRINTING OFFICE : 1960 O—535193


SMITHSONIAN INSTITUTION
THE LIBRARY


SMITHSONIAN INSTITUTION THE LIBRARY